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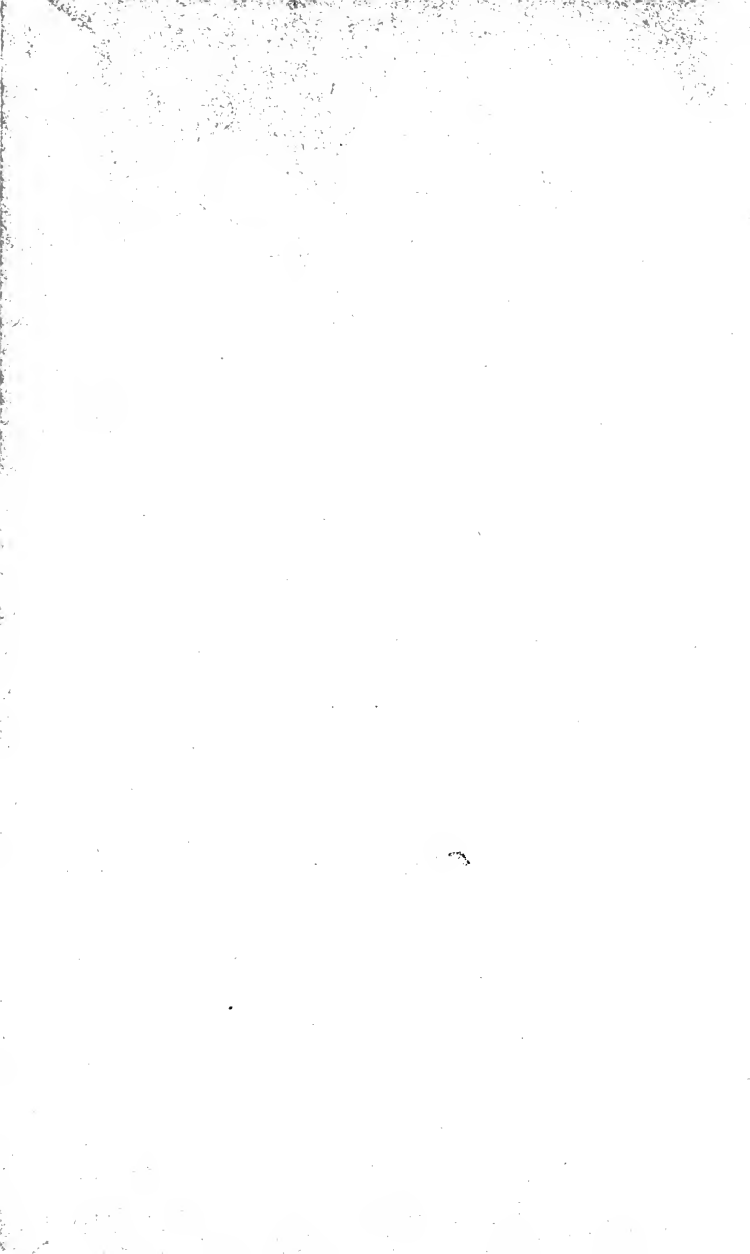
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SHEEP HUSBANDRY

IN

THE SOUTH.

PREPARED AT THE REQUEST OF HON. ALEXANDER H.
STEPHENS, OF GEORGIA, AND OTHERS.

BY

JOHN L. HAYES,

SECRETARY OF THE NATIONAL ASSOCIATION OF WOOL MANUFACTURERS.

REPRINTED FROM THE BULLETIN OF THE NATIONAL ASSOCIATION OF
WOOL MANUFACTURERS.

BOSTON:

PRESS OF JOHN WILSON AND SON.

1878.

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U.S. DEPARTMENT OF AGRICULTURE
BUREAU OF ANIMAL INDUSTRY

ANALYSIS OF SHEEP WOLLS
FROM THE SOUTH

BY
JOHN L. HAYES

BOSTON:

PRESS OF JOHN WILSON AND SON.

1878.

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SHEEP HUSBANDRY IN THE SOUTH.

THE appreciative request by which the writer of this paper has been honored * has only hastened the execution of a work which he has for a long time contemplated, and is but a continuation of an inquiry as to our national wool resources already pursued in regard to the Pacific and trans-Missouri sections of the country. In preparing an article on wool-

* WASHINGTON, D.C., Dec. 10, 1877.

JOHN L. HAYES, Esq., *Secretary of the*

National Association of Wool Manufacturers, Boston, Mass.

SIR, — In the numbers of the "Bulletin," — published as the organ of your Association — for December, 1876, and September, 1877, appear two articles from your pen, entitled, "The Part of the Wool Industry in our National Economy," and "Wool Production and Sheep Husbandry."

The interest called forth in us by the perusal of these papers has been deepened by the reading of the Report upon Wool and Wool Fabrics, made by you as one of the group of judges in the late International Exposition, which you were officially requested to prepare.

While very much has been written upon this question, relative to the advantages of the North, the West, and the Pacific slope, we feel that the special inducements of "the South" have not been recently presented by any influential authority, like that you represent.

As the objects of your Association are national in their character, we believe the proposition will meet your approval, if we suggest that you prepare a paper upon "Sheep Husbandry and Wool Production in the South," for publication in your Journal, and also for general distribution.

Being residents of, and therefore specially interested in, that section of the country, we believe that an authoritative setting-forth of the great advantages it presents for this industry, by your Association, will give a great impulse to

growing in the last-named region, we had to meet, at the outset, the objection that the encouragement of wool-production on the cheap-grazing lands in the far West involves the abandonment of sheep husbandry in the older States of the North and East; and that what the far West gains, Vermont and Ohio would lose. This objection, we said, if it were true, is a local, not a national, one.

"The aim of a national industrial system is the wealth, grandeur, and independence of the nation as a whole; and of the comfort, elevation, and well-compensated labor of the American people as a whole. Above all things, it abhors monopolies of individuals, States, or sections. It does not favor the exclusive occupation of the cotton manufacture by Massachusetts or Rhode Island, but would plant it also by the side of the cotton-fields in Georgia and Mississippi. It would light furnace fires in Michigan, Ohio, and Alabama, as well as in Pennsylvania. Statesmanship would have our national industrial system advance in its march like one of

all interests there; while it will also be of much aid and value to the reader and capitalist from any quarter.

In the hope you may be induced to render the service we desire, and assuring you of any aid we may be able to give you in furtherance of that result, we are very truly yours, &c.,

ALEXANDER H. STEPHENS, M. C. of Ga.

J. B. GORDON, U. S. S.

BENJ. H. HILL, U. S. S.

JOHN T. MORGAN, U. S. S.

M. W. RANSOM, U. S. S.

JOHN W. JOHNSTON, U. S. S.

RICHARD COKE, U. S. S.

L. Q. C. LAMAR, U. S. S.

WADE HAMPTON, Governor of So. Car.

I have not had the pleasure of reading the articles referred to; but, as Texas is most largely interested in wool-growing, I trust the articles suggested will be prepared.

S. B. MAXEY, U. S. S.

With great interest in the subject, and beg to add my signature,

T. F. BAYARD, U. S. S.

R. L. GIBSON, M. C. of La.

I join in the above. Wool-growing is one of the leading interests of my district, — Western Texas.

G. SCHLEICHER, M. C.

our grand national railroads; which must not stop for fear that the town which has sprung up on its route may be eclipsed by another, and yet another, which springs up as it advances. It must march on until it spans the continent; although, when it reaches its western verge, San Francisco may be compelled to divide her trade with Chicago. To say that the production of the new State will compete with that of the old, and that new industries will vie with those long established, is to state the principal object of the national system. Domestic competition, with its accruing cheapness, excellence, and abundance of production, neutralizes the apparent taxation imposed under the protective system. Domestic competition, gradual, equable, and healthful,—and not, like foreign competition, spasmodic, irregular, and incapable of being guarded against, and hence disastrous,—lifts the industries from their old ruts, introduces economies, labor-saving machines and processes, compels a constant watchfulness for the popular tastes and necessities, and an incessant activity for superior cheapness or excellence, and thus converts protection from a tax to a boon. It is only when the nation blushes to own each new star which she adds to her banner, that she will regret the competition in industry which each new State makes with the old.”

As then at the East writing of the far West, so now at the East writing of the South, we pursue the subject in the interest of the national wool industry, and not of a section. Still, while free from sectional predilections, we cannot divest ourselves of sympathy for a people emerging from the overthrow of a cherished social system, and struggling for the higher and broader industrial life to which recent events have forced them; and cannot but take pleasure in pointing out some of the means which offer for settling their waste and restoring their impoverished lands, for employing their labor and diversifying their industries.

Although sheep were early introduced into Georgia, and flourished to such a degree, during the colonial period, that their wool was commended by British travellers to the English clothiers as “equal to the Spanish, and superior to that

grown in England ;” although General Washington introduced the New Leicesters at Mount Vernon, the influence of whose progeny is still seen in the excellent mutton of that section of Virginia, and, further, so inspired Colonel Humphreys, who resided for a time at Mount Vernon, with a love of sheep, that he subsequently, while minister to Spain, became the introducer of the merino to this country ; and although Mr. Jefferson sent the progeny of the merinos presented to him, by Mr. Jarvis, to the counties adjoining Monticello, as the choicest boon he could offer to the agriculture of Virginia, — the breeding of sheep fell, at length, into general disrepute at the South, as is evinced by the contemptuous remark attributed to the statesman of Roanoke. This prejudice, according to Colonel Skinner, was nourished by the popular essays of “ Arator,” — the celebrated Col. John Taylor. It was more probably due to a jealousy of any product which might vie with the exclusive monopoly of cotton, to which sectional pride gave a regal title. At all events, sheep husbandry became generally unpopular throughout the South, — except, near the great cities, for a supply of mutton and lambs, — and was supposed to be attended with difficulties peculiar to the Southern climate and soil. This remark does not apply to Western Virginia, where merino-sheep husbandry has been pursued since the first importation of the race, with a success unsurpassed in any Northern States ; nor to Texas, where the pursuit was attaining a great importance, until checked by the war ; neither to a limited number of individuals, like Mr. Cockerill, of Tennessee, Mr. Peters, of Georgia, and Colonel Watts, of South Carolina, who have exhibited unusual energy and intelligence in the pursuit. Neither is it to be supposed that the number of sheep was by any means inconsiderable : for there were upwards of six hundred thousand sheep in the five most southerly States, in 1839 ; but the sheep were poor in quality, and but little cared for.

The first systematic attempt to remove this prejudice was made about 1847, by Hon. Henry S. Randall, LL.D., — since so celebrated as the author of the “ Practical Shepherd,” —

who published in the "Farmer's Library," at the request of Col. J. S. Skinner, a series of letters addressed to Col. R. F. Allston, of South Carolina, on sheep husbandry in the South. These letters were collected and published in a separate book, in 1860, by Orange Judd & Co., of New York. This work, by so high an authority and a writer so accomplished, makes us hesitate to undertake our task. It seems presumptuous to attempt to glean from a field which has been so thoroughly reaped and garnered. But as the precedence of Dr. Randall, and the short space to which our pages limit us, reduce our work to scarcely more than one of annotation and condensation, we have less diffidence in attempting it, especially since we shall be at least the means of introducing some fresh and original matter from high authorities on sheep-breeding at the South.

That a new field for sheep husbandry is about to be opened at the South, is shown less by what has been as yet accomplished, than by a complete change in popular opinion in that section as to the desirability of extending this industry within its borders. No stronger evidence of that change could be presented than the request of so many distinguished statesmen of the South that the claims of Southern sheep husbandry should receive the special consideration of the National Association of Wool Manufacturers. Personal interviews with many of these gentlemen have assured us that it is their earnest conviction, that no industry at present offers for their section such advantages in return for capital invested, and general improvement of the country in question, as sheep husbandry. As other indications of the change in popular opinion, we may state that the Commissioner of Agriculture of the State of Georgia, holding an office recently created, presented, as his first official document, a report on the sheep husbandry of the State; and that the State Agricultural Association of Georgia has recently addressed a memorial to Congress, protesting against any reduction of the existing duties protective of the wool production of the country, — the first instance, it is said, of similar action in the history of the State. The question whether the prevailing popular

opinion at the South in relation to the advantages of wool production of and sheep husbandry in that section is well founded, is the direct object of our inquiry.

This question is one of comparison. If sheep husbandry may be pursued more cheaply, and as advantageously in other respects, at the South, as in the present principal seats of the industry, it is merely a question of time, or of the diffusion of knowledge, when the fields of the South will compete with the flock pastures of the North and West; or, rather, when capital and animals will be transferred from their present seats to others at the South, where wool production is cheaper and more advantageous. The comparison must be first made in respect to only one branch of sheep husbandry, — that of the pastoral or *merino* sheep husbandry; that designed for wool production chiefly, — mutton-sheep husbandry being subject to different conditions, which must be considered separately.

Climate. — The most important relation of the climate of the North to sheep-growing is exhibited by the following table, drawn from the reports of the Department of Agriculture, exhibiting the number of months of full and partial feeding in the States named, made necessary by the severity of the climate: —

STATES.	Number of months of full feeding.	Number of months of partial feeding.
Maine	6	1½
New Hampshire	6	1½
Vermont	6	1½
New York	5½	2
Pennsylvania	5	2
Ohio	4½	2

A much greater range in the requirements for winter feeding is found at the South. The months for full feeding in Virginia are set down at four, and for partial feeding at two. The time diminishes in both respects as we go South, until in southern Georgia full feeding is required only during occasional storms, and partial feeding from two to three months.

The next point of inquiry is the relation of climate to the health and wool-producing capacity of the sheep. The effect of the climate of the North in these respects is admitted to be favorable.

Health of Sheep at the South. — Dr. Randall has given this branch of the subject minute attention. After enumerating the many thousand sheep existing in 1839 in districts of the extreme South, on the borders of the Okefenokee Swamp and the borders of the Gulf, and even the delta of the Mississippi, he says: —

“No portion of the United States is lower, hotter, or more unhealthy than much of the preceding; and none, according to commonly-received notions, would be more unsuited to the healthy production of sheep. Yet that they are healthy in these situations is a matter of perfect notoriety to all conversant with the facts. So far as *health* is concerned, then, we are assuredly authorized to assume the position, that no portion of the United States is too warm for sheep.”

Effect of Climate on the Wool-producing Qualities of the Animal. — Upon this point, Dr. Randall thus sums up his conclusions: —

“My convictions are decided, and the facts reported appear to fully sustain them, that warmth of temperature, at least to a point equaling the highest mean temperature in the United States, is not injurious, but absolutely conducive, to the production of wool. The causes of this are involved in no mystery. Warm climates afford green and succulent herbage during a greater portion of the year than cold ones. Sheep plentifully supplied with green herbage keep in a higher condition than when confined to that which is dry. High condition promotes those secretions which form wool. Every one at all conversant with sheep well knows that, if kept fleshy all the year round, they produce far more wool than if kept poor. A half a pound's difference per head is readily made in this way. Within the maximum and minimum of the product of a sheep or a flock, the ratio of production always coincides with that condition.”

Some other facts, not referred to by the author, illustrative of the beneficial influence of warm climates upon the merino-sheep husbandry, which we have now specially in view, may

be here stated. M. Moll, the distinguished scientific reporter on Wool at the Paris Exposition of 1867, says: "We observe that it is the vine and mulberry which best suits the ovine species in general, and the fine-woolled races in particular." It need not be remarked that the more southerly States emphatically belong to the vine-bearing zone. The great merino wool-clip of the world is produced in even warmer latitudes. The Argentine Republic, standing second in the world in the supply of the wools of commerce, — having 57,501,260 sheep, producing 216,000,000 lbs., — has a climate where the cold of winter is so moderate as to produce no more severe effects than slight hoar-frosts, which disappear with the morning's sun. Its wools, chiefly merino, are fine and soft; having, as their principal defect, the burr clinging to the fleece, derived from the white medoc or clover, on which the sheep feed, unfortunately in that country inseparably connected with the productive lands and best pasturage. The most productive merino-wool regions in Europe are the southern provinces of the Russian Empire, where the climate is so mild that the sheep require shelter and fodder only about six weeks in winter. Single flocks in that country reach to fifty, seventy-five, a hundred thousand, and even four hundred thousand head. Specimens of merino wools from this region, shown at the Centennial Exhibition, in fineness and extreme length of staple surpassed any exhibited. Mr. Graham, author of the most accepted handbook of the sheep husbandry of Australia, asserts that "The 'Salt-bush' country in New South Wales, a region of excessive heat, can and does in some instances produce as heavy and valuable wool as do any other portions of the Australian colonies. It was the received *dictum*, in 1845, that the climate of the Darling Downs, within the tropics, was too hot for the growth of wool. The Superintendent of the Clyde Company thought otherwise, and adopted a careful and judicious system of selection. In eight or nine years, the Darling Downs produced as good wool as any grown in Australia, although it still bore the name of *hot-country wool*."

To the Northern farmer, accustomed to see his sheep and

cattle suffering and refusing nourishment during periods of excessive heat in the Northern summers, it may seem inconceivable that sheep should not be unfavorably affected by the hot summers of the South. But it should be remembered that the summer heat of the South is tempered by the breezes blowing from the Gulf; and that, at New York, in midsummer, the days are very nearly one hour longer than at Savannah, and the nights correspondingly shorter: consequently, at New York, there is one hour longer for the heat to accumulate from the direct rays of the sun, and one hour less time in the night for the accumulated heat to be carried off by radiation. From these two causes, the summer heat is never so excessive in Southern as in Northern latitudes.

But it is asserted that warmth of climate, while promoting the quantity of wool produced, enlarges the fibre, making the wool coarser. This was the opinion of Dr. Randall, and is still generally adopted. He says: "There can be but little doubt that the pelage of the sheep becomes finer in cold climates, and coarser in warm ones." He sees the causes of this phenomenon in the greater amount and quality of the nutriment received by the animal in warm climates, which maintain in greater activity those secretions which form wool, and that increase the quantity and weight of the fleece. The weight, he thinks is increased by increasing the length and thickness of the separate fibres; just as plants put forth longer and thicker stems on rich soils than poor ones.

The popular belief that wool becomes coarser in warm climates is strengthened by the admitted fact, that sheep, originally covered with hair and an undergrowth of wool, when introduced into very hot climates within the tropics in time become covered with hair alone; the wool, as is supposed, being converted into hair. This supposition is not correct. The wool part of the fleece is not changed: it is lost. Mr. George W. Bond, an eminent expert in wool, has recently exhibited, to a scientific society, skins of Arabian sheep, some of them covered with hair alone, and others having similar hair, but with a thick undergrowth of wool. The fibre of the wool proved by test to be equal to that of

the very finest Saxony wool. The fibre of the wool proper, then, is not changed or enlarged by climate.

But this question, it would seem, has been finally put at rest by the carefully conducted experiments of Professor Sanson, the most eminent zoötechnist in France; published in the *Comptes rendus* of the French Academy,—such a publication by that body being in itself a sufficient indorsement of Professor Sanson's scientific authority. The importance of the observations justifies us in giving at length a large part of Professor Sanson's note to his table of experiments, given by him in detail. His researches were made upon twenty specimens of wool. The animals from which the wool-fibres examined were derived, he calls "precocious" merinos; that is, animals so bred and highly fed as to produce the utmost weight of fleece and flesh: the race having, besides, the quality of maturing early. He says:—

"It is generally admitted, from reasoning *à priori*, that the rapidity of growth in precocious merinos, due to the abundance and special qualities of nourishment, cannot fail to increase the size of the hairs of the same wool. I have proposed to determine scientifically the truth of this induction." After stating his experiments and manner of conducting them, he considers certain propositions demonstrated; among which are the following:—

"1. The precocious development of merino sheep, having the effect to carry their aptitude to produce flesh to the highest degree that sheep can attain, exercises no influence on the fineness of their wool. This preserves the diameter which it would have, had it developed in normal conditions, for the reason that this diameter depends upon the individual and hereditary aptitudes.

"2. The influence exercised by the precocious development upon the hair of the wool exhibits itself by an augmentation of the length of the same hair; its growth, resulting from the formation of epidermic cellules in the hair bulb, being more active. There is, therefore, more woolly substance produced in the same time.

"3. The precocious development does not vary the number of hair or wool bulbs existing for a determinate extent of the surface of the skin. It produces, therefore, no change in what is vulgarly called the

tasse (density of staple). The modifications which the staple of wool presents in this respect are only apparent. By increasing the length of the hairs, the precocity necessarily increases that of the locks of wool which they form, which makes the fleece appear less dense."

The views here presented, we admit, would not be accepted by the majority of our breeders. But all will admit that any tendency of warm climates (if such exists) to make wool coarser can be easily counteracted by judicious breeding.

In connection with the question of the effect of climate on the *fineness* of wool fibre, we may appropriately quote a breeder of great reputation in Tennessee, but whose flocks were in Mississippi. His statement is old; but the more valuable, since the culture of fine Saxon sheep has now almost wholly ceased in this country. Mr. Mark R. Cockerill, in a letter published in the "American Farmer."

"I have about 1,000 head of fine sheep. . . . My Saxon sheep were imported in 1824 or 1826, — I cannot say which, — and I find as yet no falling off in the quantity or quality of their fleeces: on the contrary, I believe, a little improvement in both points, and a little more yolk when well provided for; which, you know, does not much abound in the Saxon breed. In addition, the fleeces are a little more compact than formerly, hence more weight; and, from our mild climate, the staple has become longer. I assert that the cotton region I am now in (Madison County, Mississippi), in about 32° north, is better than any country north of it, to grow wool, as the sheep can be kept all the time grazing, by sowing small grain; for, if grazed off, it quickly grows again in a few days. And the wool of the fine Saxon sheep in this climate is softer and more cotton-like than any I have ever seen, although I have samples from all parts of the world. I have travelled from this very place to Boston, sampling all the sheep of note on the way; and I have found nothing on my journey, or at Boston, as good as the wool I have grown; and so said all the wool-staplers whom I met with, and they were not a few. I presume, in reality, that the blood of my sheep was no better than many I saw; *but the superiority of my wool I ascribe to our climate*, and the provision for the sheep of succulent food the year round."

Having examined the volume of awards of the Exhibition at London of 1851, commonly called the World's Fair, we

find that the reports of the juries recognize the German wools as the finest and longest. Two prize medals of the same grade given to the German exhibitors were awarded to exhibitors from the United States. The awards are arranged in the order of merit. The first is given to Mr. Cockerill. It says: "The wool transmitted by the exhibitor from Nashville is well got up; and exhibits, like the preceding specimens (the German), a quality of fibre indicative of care and skill in the development and improvement of the fleece, which calls for the award of the prize medal." The report further says: "One of the able experts, whose valuable aid the jury have already acknowledged, reports, 'Those shown by America (United States) as most approximating to the character of German wools.'"

Mr. Howard, of Kingston, Georgia, writing to the Department of Agriculture, in 1874, says:—

"It is objected that wool degenerates in warm climates, and becomes coarse and valueless. This is an error. The writer, whose flock is of the Cockerill merinos, which took the premium at the World's Fair in London, many years ago, the sheep being reared in Mississippi, after this lapse of time is now ready to compete with any wool in the United States in fineness of staple."

The quality of extreme fineness in wool is much less regarded now than formerly, on account of the changes in fashion of fabrics. The great bulk of wools at present consumed is of medium grades. Length of staple, however, has become a very desirable attribute, on account of the increased demand throughout the world for wools for combing purposes, which enter into worsted coatings and a great variety of dress goods. This quality of length of fibre, it is seen, is greatly favored by the propitious climate of the South. As our manufacturers advance to the production of the higher qualities of dress goods, such as the French merinos and the very finest grades of worsted coatings, which are now coming into demand, fineness no less than length of staple would be demanded for merino-combing wools; and, for both of these qualities, it is shown that the climate of the South is favorable.

Culture of Electoral Wools recommended.—There is likely to be no more appropriate place than in this connection to speak of a class of wools whose culture has almost ceased in this country, and has greatly declined throughout the world. We refer to the exceedingly fine electoral wools, such as were formerly produced by the old Saxon sheep, and at present by the Silesian sheep of the same or a very similar race. They are still cultivated, to a limited extent, in Silesia, Hungary, and Poland, which countries produce all the superfine wools used in Europe. The few wools of this class used here are imported from these countries, at enormous prices. Fashion, invariably revolving in great cycles, always repeats herself in time. Superfine broadcloths, and other tissues demanding the finest fibre, will again be in vogue. The electoral wools will secure prices, as they have never yet done, proportionate to their high cost of production. On account of the delicacy of the animals producing them, these wools cannot be successfully grown at the North; as we know personally from observation on the paternal farm in Maine, where their culture was formerly attempted with the utmost energy, but with such poor results as to cause their abandonment. In the mild climate of the South, their successful culture is assured beyond all question. This is proved by the letter last quoted. Mr. Watts, of South Carolina, in his communication elsewhere given at length, says:—

“I have now on my table a Silesian wool, measuring, say, 1,800 hairs to the inch, which cost the consumer here one dollar and fifty cents in gold per pound. With none of the ridiculously extreme care which the European growers of the electoral wool exercise in their flocks, Mark Cockerill, of Tennessee (near Nashville), has raised Saxony wools of a fineness of 2,000 hairs to the inch, and could sell it at a handsome profit at one dollar per pound. In fact, Mr. Cockerill claims that there is more margin of profit in it than in the growth of more ordinary wool.”

These wools are designated in Germany as *noble* wools. Their successful culture was deemed a fit employment for noblemen of high birth; and the princes of Hungary, we are in-

formed, now the principal growers there, continue the production from motives of pride. Two Hungarian princes competed with each other on exhibits of *noble* wools at our Centennial Exhibition. The patrician element of the South would be not uncongenial to a similar industrial competition.

Asking pardon of our readers for this digression, we proceed to consider other important conditions of successful sheep husbandry.

Resources for the Nutrition of Sheep. — The next point of inquiry is as to the resources, natural or artificial, for the nutrition of sheep in the South. This involves not only further consideration as to climate, but also the influences of physical geography, soil, and hygroscopic conditions. As it would be impossible, in our limited space, to consider these conditions in each of the Southern States, we will select a typical district, such as that composed by the States of Georgia, and North and South Carolina. The physical geography in this district is very distinctly marked, and is illustrated by the natural divisions in Georgia known as Lower, Middle, and Upper Georgia, or low country, hill country, and mountain country; the characteristic features of these divisions extending through North Carolina to Virginia. The lower division, sometimes called the tide-water zone, consists, in Georgia, of a belt of country, with an area of about 35,000 square miles, much rising as high as 300 feet above the ocean. Geologically, it consists of the three divisions, Eocene, Miocene, and Pliocene of the Tertiary period. The soils on the dry lands are generally light, and sometimes too sterile to admit of profitable cultivation; that of the swamps and river bottoms is often exceedingly fertile. This is the land of the long-leaved, or famous Georgia pine, and wire grass. The middle region commences at the head of navigation of the rivers, the line of junction of the two regions forming the line upon which the great interior cities are situated. The middle, or hill country, having an area of about 15,000 square miles, rises, first, into gentle hills, and finally, as it approaches the mountains, into high and often broken elevations. The geological formation underlying this country consists of the

Primary and Metamorphic rocks, and the soil in its natural state is generally fertile. In this division is comprised what was formerly regarded as the *el dorado* cotton country of the State. The mountain country above this, with an area of about 10,000 square miles, is formed by the different chains of the great Appalachian range. For further details as to a portion of this district, North Carolina, the reader is referred to the valuable paper of our correspondent, Gen. John A. Young, published in the Appendix.

With the indications as to natural soils given in the above sketch, in order to determine the resources of the country in question for supplying pasturage and forage for sheep, we must consider certain atmospheric conditions, which apply not only to the immediate sections under consideration, but to the whole of the vast country lying south of the thirty-fifth parallel, and between the Atlantic and the meridian of San Antonio, Texas, which is *par excellence* the cotton belt of America. The remarks of Mr. Walter Wells, in his admirable paper on the cotton culture in the United States, on the influence which the rainfall has on this culture, are very instructive in this connection.

“The cotton plant, in its period of growth, requires abundant rain; its succulent foliage, if duly supplied with moisture, appearing fresh under a sun that shrinks the leaves of a majority of other crops. In the cotton-growing district surrounding the Gulf of Mexico, the fall of rain is so profuse through the midsummer as to suggest very distinctly the temporary establishment of true tropical conditions,—the lapping over of torrid-zone rains upon this portion of the temperate zone while the sun is at its northernmost declination. As the sun retires, the tropical conditions give way; the comparatively dry, serene, and temperate autumn of the mid-latitudes succeeds, securing most favorable conditions for the maturing and gathering of the cotton harvest.

“The cotton plant seems to be, in a peculiar manner, dependent upon the *latent* or *hygroscopic* moisture of the atmosphere, for the perfect development of its peculiar product. It loves the influences of the sea. The great volumes of vapor raised from that immense evaporating cauldron, the Gulf of Mexico, drawn inland by the draught

of summer heat, not only supply to all the surrounding country profuse rain, with numerous, and at certain seasons almost daily, showers, but immerse all vegetation in an atmosphere charged to repletion with a liquid and bland solution; hence the long, trailing, moisture-loving mosses of the Southern forests, and hence a vigor of the cotton-plant and softness of its staple elsewhere hardly paralleled."

It need not be said that the influences which affect the cotton-plant so favorably must have an equally beneficial effect upon the plants required for the pasturage and forage of sheep, provided they are adapted to the climate; especially upon the grasses, grass of all vegetation being soonest affected by drought on the one hand, and an over-abundance of rain on the other. "It is," says a recent writer on British sheep-farming, "the regularly distributed rain—the fine weekly or bi-weekly showers—that the grazier can alone build upon for success in raising wool and mutton." The very existence of the American cotton belt proves at least that within it no such droughts can prevail as compel the *transhumance* of the merinos of Spain and Upper California, and in Lower California destroyed during the last year millions of sheep.

The Grasses.—In a country where cotton was, until very recently, looked to as the only market crop, and grass as the deadliest enemy of cotton, and where but few animals were required for labor, it could not be supposed that there should exist the rich, thick-swarded pastures or meadows of many portions of the North. But grass culture is now attracting large attention at the South, and, happily, from persons of science and practical knowledge. Conspicuous among them was Mr. C. W. Howard, recently deceased, whose extremely well-written manual on the cultivation of grasses and forage plants at the South is the principal source of the notes which follow. Mr. Howard, speaking generally but carefully, says, that, after an observation of more than twenty years, he does "not hesitate to say, if ground be made sufficiently rich and as well prepared; that if judgment be exercised in sowing, and in adaptation of species to particular localities, and proper subsequent management be observed,—that, so far as soil and climate are concerned, the

South has unusual fitness for the successful cultivation of the valuable grasses."

While admitting that there are portions of the South (as is the case in all countries) where the grasses will not grow, he declares unhesitatingly, "There is nothing in the *climate* of the South to prevent the successful growth of the valuable grasses." Omitting all that he says upon the culture of grasses for hay, — as the winter grazing at the South is a substitute, except in exceptional periods, for this indispensable fodder for sheep at the North, — we will condense his observations upon the grasses for pasturage.

One of the most marked advantages of the South is the ability to grow grasses which may be pastured in winter. Thus the cost of cutting the grass, and saving the hire of barn for storing it, and the cost of feeding it out, are dispensed with; while succulent food, which, at the North, must be provided for by storing roots and vegetables, is afforded throughout the year. By the aid of winter grasses, it is perfectly practicable, throughout a large portion of the South, to raise sheep without other cost than the interest on land and the value of the salt. Oats, barley, and rye, sown in the fall, may be grazed during the winter without injury to the crop of grain, as is frequently done; but they must be sown annually, and are inferior to permanent grass pastures. The meadow oat, orchard, and blue grass, with wild rye or Tyrrell grass, are chiefly relied upon for permanent winter-grass pasture.

Spring pasturage is afforded by the broom sedge; and the summer pasture, by the native crab-grass, — an annual peculiar to the South, which springs up everywhere at the South in the stubble where small grains had been harvested, making a summer pasture which cannot be surpassed. Very sensible farmers at the South have estimated the crab-grass pastures of a fair season, on stubble land, as being nearly equal in value to the preceding small-grain crop. "The Northern farmer," as Mr. Howard observes, "has nothing to correspond with our crab-grass. His stock are eating, without appetite or relish, in August and September, the old grass of the

spring ; while our stock are luxuriating on the fresh bite of the newly sprung crab-grass." Mr. Howard does not mention the Japan clover (*Lespedeza striata*). This exotic, as we learn from reports to the Department of Agriculture, is rapidly taking possession of uncultivated places in South Carolina, and even in Tennessee. It is highly relished by sheep, and, although short, furnishes a good pasture from May till frost.

The grass, however, *par excellence* for summer pastures at the South is the Bermuda grass,* and would seem to surpass any known at the North. This species, chiefly found at present in Middle Georgia, though abundant in Louisiana, was introduced from the West Indies, and is believed to be identical with the celebrated *daub*, or sacred grass, of East India. Being stoloniferous in its habit, it clings so closely to the soil that it is eradicated with great difficulty ; and, rapidly propagating itself by means of its runners, it was regarded as the worst pest of the cotton plantation. "Fighting General Green" became a proverb which illustrated the perpetual

* This grass is known in India by the various names of *daub*, *doob*, *darbba*, or *darva*. Sir William Jones, in his "Botanical Observations of Select Indian Plants," published in "Asiatic Researches," vol. iv. p. 520, speaks thus of the *darbba* or *daub* grass : "Every law-book and almost every poem in Sanscrit contains frequent allusions to the holiness of this plant ; and, in the fourth Veda, we have the following address to it, at the close of a terrible incantation : 'Thee, O Darbba ! the learned pronounce a divinity, not subject to age or death ; Thee they call the armor of *Indra*, the preserver of regions, the destroyer of enemies, a giver that gives increase to the field. At the time when the ocean resounded, when the clouds murmured and lightnings flashed, then was Darbba produced, pure as a drop of gold.'"

Capt. David Richardson, in the seventh volume of the "Asiatic Researches," says of this grass, which he calls "doob grass : " "This is probably one of the most useful and beautiful grasses in this or any other country ; and, like the cow which feeds on it, is held in high religious veneration by many tribes of Hindoos. A natural velvet carpet, if the expression be admissible here, may at any time be formed of this elegant grass, in the space of two or three weeks, merely by cutting it in pieces and sprinkling them on prepared ground mixed with earth. In this way, the beauty of rivers, public roads, fortifications, garden walks, and marginal borders, is frequently secured in India, upon principles which unite expedition, elegance, and strength, in one verdant sward, which, to those unacquainted with the rapidity of vegetation in these climes, has almost the appearance of enchantment." It is curious to observe that the same mode of propagating this grass is followed in India as in our States at the South.

warfare which the planter had to wage with the Bermuda grass. Not unfrequently the grass was the victor, and many considerable districts were completely abandoned to its sway. It is now thoroughly appreciated by the best cultivators of the South. "I think it," says Col. A. J. Lane, a successful cotton-planter, "very doubtful whether there is an acre of land thoroughly set in Bermuda grass (if the proper use is made of it) that is not worth more than any crop that can be grown upon it." It will flourish on dry and almost barren lands. It will hold its place indefinitely. Its nutritive power is said to surpass that of blue grass; it containing, according to the analysis of Dr. Ravenel, fourteen per cent of the albuminoids. Its yield in weight far surpasses that of clover. Although it produces no seed, it is easily propagated by sowing broadcast pieces of the roots obtained from the turf, washed free from the dirt, and chopped fine by a cutting machine. The grass, when grazed, forms a very compact sod, which, turned in by the plow, has extraordinary manurial value. The results of cultivating thirty acres of land well set with this grass are thus stated by Colonel Lane:—

"First crop: cotton, half stand, owing to the mass of undecomposed sod; eighteen hundred pounds of seed cotton per acre.

"Second crop: cotton, two thousand eight hundred pounds seed cotton per acre.

"Third crop: corn, sixty-five bushels per acre; corn manured with cotton seed.

"Fourth crop: wheat, forty-two bushels per acre.

"The average product of this land, without the sod, would have been not more than one hundred pounds of seed cotton, fifteen to twenty bushels of corn, and eight to ten of wheat."

According to Mr. Howard, by turning up Bermuda grass land by the plow, and sowing blue grass and white clover, a pasture can be produced capable of sustaining stock summer and winter. As the Bermuda grass dies down in autumn, the blue grass and white clover appear; the reverse occurring in the heat of summer.

We will conclude our extracts from this writer with one more directly pertinent to our subject.

“More than thirty years ago, the writer, walking with a gentleman of far-reaching mind, and observing the gullied and excoriated condition of the soil near Milledgeville, inquired: ‘What is to restore its fertility to the worn-out portion of Georgia?’ The answer was promptly given: ‘Sheep, and Bermuda grass.’ There was profound wisdom in the reply. A large portion of old Georgia must become a sheep-walk, before it can be restored to fertility, and the land-owners can become independent of the negro.”

A correspondent from Memphis, Tennessee, writing to the Department of Agriculture in January of the present year, says:—

“The best of all our grasses, though not a winter grass, is the Bermuda. Too much cannot be said about it as a pasture grass; and, if the South were half covered with it, we could then have fat sheep and plenty. For successful sheep-raising at the South, we want this grass alone. Turnips, — plenty of them, not patches, — large fields of them, and fields of rye or wheat or oats to pasture on in winter, will make up for the rest of the year.”

Forage Plants. — To this testimony as to the relations of Bermuda grass to Southern sheep husbandry may be added — although his enthusiastic deductions need some qualification — that of Dr. George Little, the State geologist of Georgia, who says:—

“When the value of Bermuda grass is appreciated by farmers, and the thin and waste portions of their farms are clothed with it, which seems to have been intended especially for sheep, Georgia will sustain a sheep to every acre of territory, and 37,000,000 of sheep would be worth to their owners in the aggregate \$37,000,000, net, per annum, — nearly double the present gross value of the cotton crop of the State.”

There are exceptional periods when winter pastures will prove insufficient. These periods, short at the extreme South, become longer with the ascending latitudes. Some supply of cured forage is indispensable for these periods. The field pea, which grows luxuriantly on all the sandy soils of the Tertiary formations of the South, is for that country what the clover is to the North. It is highly recommended by Mr. Howard and Dr. Randall as a winter forage for the South, as its haulm, or straw, when cut partially green, makes a rich fodder relished

by all stock. Dr. Randall says that, "for sheep and breeding ewes, there is probably no feed in the world equal to nicely cured pea haulm, with a portion of the seed left unthreshed. It gives them condition and vigor, and prepares them to supply a bountiful supply of milk for their young."

To this may be added the sweet potato, — another peculiar product of the South. It is estimated that from two to three bushels of sweet potatoes are equal in value to one bushel of corn. More than three times as many bushels of sweet potatoes can be raised on an acre as can be raised of corn on the most fertile lands of the West. Well-cured pea vines and sweet potatoes afford as cheap and valuable food for *fattening* sheep as can be found in any country whatever. A still more important product, peculiar to the South, must not be overlooked, — the abundant cotton seed, more nutritious than any grain, and so cheap that it is afforded in Georgia for fifteen cents a bushel.

Alfalfa. — California has recently brought into prominence a plant of foreign origin, which is destined to replace all others at the South for soiling or hay. This is the alfalfa, Chili clover or lucerne, *Medicago sativa*. Although introduced into California from Chili, — whence its Spanish name, — it has long been the chief reliance of the French farmers. While it will not succeed in England, for want of sun, nor at the North, on account of the winter's cold, it has been thoroughly tested at the South, and found to thrive from Texas to Virginia. Its requirements are very rich light and dry land, such as will be permeable to its long tap root, which penetrates the ground, sometimes as deep as seventeen feet, for the moisture which enables it to resist any degree of superficial dryness. These requirements being met, it will, after the first year, yield from six even to eight tons of hay, which is preferred by cattle and sheep to any hay whatever. A writer in the Transactions of the State Agricultural Society of California for 1871 says that the alfalfa is the only plant which will grow through the dry summers of that State, and keep green all summer. He is assured, by those that have pastured sheep upon it, that one acre of good land will

keep forty sheep in good condition all the year round. The "Pacific Rural Press," of March, 1878, describing a ranch having seven thousand sheep, and other stock in proportion, says that thirteen hundred acres, sown to alfalfa, were cut last year five times, yielding about one and a half tons of hay to the acre to each cutting. From 35,000 to 40,000 acres in California were seeded with this clover in 1876. Its culture is regarded as the only hope for preserving the sheep husbandry in the dryer portions of the State. It flourishes admirably in Texas; keeping green all winter, and affording feed to all kinds of stock. In upper portions of Georgia, the alfalfa does not keep green through the months of December and January, and is used only for seeding and hay. It would probably keep green through the winter in the lower parts of the State, and might be pastured.

Turnips.—An important feature of the climate of the South is that the wool-grower of that region can adopt the English practice of folding sheep on turnips. It is well known that the first great step in the improvement of the sheep husbandry of England was the introduction from Holland, by William of Orange, of the turnip culture, at the end of the seventeenth century. They were fed to sheep; and it was found that, by this system, the same land would support treble the number of sheep. Turnips and sheep form the foundation of the English four-field system, and are the basis of English agriculture. This system cannot be adopted at the North, on account of the turnips freezing in the ground.

The folding system is especially fitted for the sandy lands on the coast, both as the cheapest means of ameliorating them, and because such soils are favorable to the growth of the turnip.

The mode of procedure is this: After turnips are grown on land which has been suitably fertilized and cultivated,—say in December or January,—a fold is made of hurdles or a portable fence, enclosing as many turnips as the flock of sheep will eat in twenty-four hours. One thousand sheep will consume the turnips on an acre in that time; one hun-

dred, a tenth of an acre in the same time. The manure deposited by the sheep in that time will suffice for four years' rotation. Mr. Howard, in his admirable paper on the condition of agriculture in the cotton States, says of this system, which he has practically tested on Georgia lands:—

“The advantage of folding turnips is twofold. It is by far the cheapest method of manuring land. No hauling manure is required, as the sheep haul their own manure, both solid and liquid, to precisely the spot on which it is desired to apply it. It is evenly spread, without labor, no part being excessively manured at the expense of another part. The effect of this manuring will be felt for years. Land so manured is good for two bags of cotton to the acre the following year. The other advantage is the fine condition into which the sheep are put at a season of the year when mutton brings the highest price. When land is put into sufficiently good order to bring five hundred bushels of turnips to the acre, the gain in mutton is equivalent to the cost of the crop. The heavy manuring of the land is, then, clear gain.”

Present Condition of Southern Sheep Husbandry.—When we turn from this picture of the possibilities of sheep husbandry at the South, to its actual condition at the present time, the contrast is very painful. The reports of the very able statistician of the Department of Agriculture, which, from a careful examination of the system adopted by him in arriving at results, we regard as very reliable, show the numbers of sheep in the States of the cotton belt, excluding Texas, to have been as follows, in January, 1878:—

STATES.	Number of Sheep.	Area in Acres.
North Carolina	490,000	32,450,560
South Carolina	175,000	21,760,000
Georgia	382,300	37,120,000
Florida	56,500	37,931,520
Alabama	270,000	32,462,080
Louisiana	125,000	26,461,440
Arkansas	285,000	29,184,000
Tennessee	850,000	14,720,000
Mississippi	250,000	30,179,840
Total	2,683,000	267,267,440

The area of the States named is derived from the Reports of the Land Office.

Thus there are in these States not far from one sheep to every 267,000 acres. Ohio, with an area of 25,766,960 acres, has 3,783,000 sheep, or a sheep to about every eight acres.

One county in Pennsylvania, Washington, has over 400,000 sheep, producing as good merino wool as there is in the world, while the whole of Georgia has not that number.

The U. S. Commissioner of Agriculture, with a due appreciation of the importance of sheep husbandry to the South, has recently sent circulars, with minute inquiries as to the present condition and possibilities of this industry, with blank returns, to his assistants in each county of the Southern States. The original returns to these circulars received in January, we have been kindly permitted to examine, and have carefully read every one received. The general impression made upon our mind by these returns, as to the actual condition of sheep husbandry, in most of the States, was far from agreeable. The returns did not show a single case of a well-bred and carefully kept flock, such as we found in the North; although it is known that there are exceptional cases of such flocks. As a rule, the variety kept is the native breed, producing about two pounds of wool, selling from 25 to 30 cents. Very few flocks, as would be seen, reach a hundred in number. Frequently the animals obtain their entire subsistence from the swamps and range. Those which have somewhat better care during the winter months, receive a little cotton seed and a few turnips, and straw from the threshing-floor. But no provision seems to be made of hay or other forage. All the returns agree in declaring that the great obstacle to sheep-raising is the destruction by dogs; popular opinion having hitherto prevented the enactment of suitable dog-laws. One return says: "There are but two successful wool-growers in this county, and their ranges are in constant supervision, a stock-minder in each constantly patrolling."

There is now and then a hopeful gleam in the returns. A farmer in Georgia says, "his 'herd' of 104 sheep produced \$132.50." It cost only \$10 to feed them on cotton seed.

"What my sheep make," he says, "is just like picking it up."

Major R. A. Griffin of Horry County, South Carolina, stated by the reporter to be a person of acknowledged skill and success in sheep husbandry, says: "An individual experience of twenty-five years has proven that the *increase* will pay all expense of keep, leaving fleeces and manure as profit."

Thomas M. Bealy, of South Carolina, says: —

"Oats and rye are the only small grains, except rice, that will grow here. For every plough animal on the farm, the farmer should sow down, sod well prepared, in September, six acres of oats. Upon these oats, he should turn in three to five head of sheep the middle of December. It will give them the best of pasture until first of March, when they should be turned out, and the oats left to head up. Each six acres of these oats should yield feed for one horse or mule twelve months, and kept in order at constant work without a grain of corn. Such farming would make a man rich in a short time."

E. C. Ethridge of Colerain, North Carolina, says: "When sheep culture receives the attention that cotton now does in this section, it will be the most prosperous country in the world."

Andrew A. Spaulding, of Rockingham County, North Carolina, born a Scotchman, says: —

"I am from the North, and have been here four years. I believe this is the making of a good agricultural country, if it was properly cultivated by an improved system of farming; particularly, sowing grasses and clover, having a rotation of crops, keeping more stock, and letting the fields lie three years in grass, and sowing down yearly as much as is taken up. By this means, the farmers would be better off, and the land vastly improved."

A more exact picture of the sheep husbandry of the South, as hitherto pursued, is given by our intelligent correspondent, General Young, of North Carolina, who, as a wool-manufacturer, has been led to give particular attention to the wool resources of his own State. He says: —

"Twenty years' experience in manufacturing the wools grown in this State has familiarized the writer with the manner in which this

valuable animal (the sheep) has been cared for ; and has convinced him that, without great natural advantages, their utter neglect would long since have exterminated them from the soil. There are but few plantations in the State upon which there was not to be found a flock of sheep, intended to be *only* sufficient to furnish the wool necessary to clothe the family, and furnish an occasional mutton. These sheep were generally the 'native' breed, rarely improved by crosses upon foreign blood. As a general rule, these small flocks never entered into their owner's estimate of his valuable property, and they were never so treated. In the spring, they were shorn of their fleeces, and turned outside their owners' enclosures to seek their summer's support in the forests and waste lands, over which they chose to roam, and to run the gauntlet for life among hungry hounds and gaunt curs, almost as numerous as themselves. All that might escape, and were able to find their homes in the fall season, and would seek its inhospitalities in the winter, would be admitted within the gates, and permitted to eke out a scanty living in the denuded fields and corners of worm-fences, which is supplemented by a morning and evening allowance of corn fodder, which the compassionate and appreciative owner allows to be fed to them by a boy who has not yet attained sufficient size to be otherwise useful. The only protection against the rains and occasional storms of winter, afforded to a majority of the flocks, being such as their instinct leads them to seek, by hovering on the sheltering sides of barns and out-buildings that may be accessible. Yet, under this treatment, the flocks of the farmers kept their numbers full, and occasionally multiply beyond their wants."

The facility with which these flocks may be improved is well illustrated by General Young. He says :—

"Of necessity, the fleeces of these sheep are light and inferior. But, wherever an effort has been made to improve the stock by crossing on merino or other approved blood, the effect is satisfactory and lasting. From the universal custom of turning the entire stocks into the common 'range,' the impression of a merino, Southdown, or other importation, would manifest itself upon the flocks of entire neighborhoods. So apparent is the improvement thus made, that, in purchasing the surplus brought to market, there would be no difficulty in recognizing the wool from a neighborhood that had been favored by some enterprising farmer having imported from Virginia or Pennsylvania a pair of blooded animals. Without any change in the mode of treatment,

these improvements are known to be distinctly manifest in neighborhoods thirty years after their introduction. Being able to withstand all the hardship and neglect, and promptly to respond to every effort to improve their quality or condition, it is evident that there is in North Carolina an adaptation of natural gifts to their peculiar wants."

The returns to the Department of Agriculture before referred to make no mention of the large flocks — reaching as high, in some cases, as 3,500 — which are spoken of by the Commissioner of Agriculture of the State of Georgia, as occurring on the pine-lands of that State. We learn from General Abbott, of North Carolina, that flocks reaching up to 1,000 head are found on the pine-lands of that State. These flocks, if they can be called flocks, are never fed; the care of the owners being limited to marking and gathering them up for shearing. This can scarcely be called sheep husbandry; for husbandry implies care, and provision for sustenance. Indeed, of the large portion of the South, — especially the lower South, excluding Texas, — with exceptions which almost could be counted on the fingers, taking into view the general want of care and provision for sustenance, it may be said that sheep husbandry, in the proper acceptation of the term, does not exist in that country. This cannot be considered a reproach. The exclusive devotion to cotton accounts for it. And the interest now taken in sheep culture by the most intelligent men of the South, and the general interest recently manifested by the numerous letters received by the Department of Agriculture, asking for information on the subject, are guaranties of a brighter future in this industry at the South.

Our view of the actual condition of this industry at the South, we admit, does not correspond with the impression readers would be apt to form from the report of the Commissioner of Agriculture of the State of Georgia, upon the sheep husbandry of that State. He says, that "the average annual profit on the capital invested in sheep in Georgia is sixty-three per cent. The average annual cost of keeping sheep is only fifty-four cents. The average cost of raising a pound of wool is only six cents; while the average price for which the unwashed wool sells is thirty-three and a third

cents, or twenty-seven and a third cents net." These results are alleged to have been, and undoubtedly were, derived from returns addressed to those engaged in the business. Particulars are given of only two cases, which we will quote:—

"Mr. David Ayers, of Camilla, Mildred County, in South-western Georgia, where snow never falls and the ground seldom freezes, and where the original pine-forest is carpeted with native grass, says his sheep—3,500 in number—cost him annually fourteen cents per head, clip three pounds of unwashed wool, which sells at thirty cents per pound, giving a clear profit of ninety per cent on the money and labor invested in sheep. Mr. Ayers does not feed his sheep at any time during the year; neither has he introduced the improved breeds, using only what is called the native sheep."

"Mr. Robert C. Humber, of Putnam County, in Middle Georgia, keeps one hundred and thirty-eight sheep, of the cross between the merino and the common sheep. He says they cost nothing, except the salt they eat; while they pay one hundred per cent on the investment, in mutton, lambs, and wool. They yield an average of three pounds of wool per head, which he sells at the very low price of twenty-five cents,—less than the market-price. It costs him nothing, except the shearing. His sheep range on Bermuda grass,—old fields in summer, and the plantation at large, embracing the fields from which crops have been gathered, and the cane bottoms in winter."

We are not disposed to deny that the estimates of profits made by the commissioner, or given in the particular cases cited, are literally correct. But we are compelled to state, that some of the returns from the above-named State, at the U. S. Department of Agriculture, express dissent from the commissioner. One return says: "His figures are too low for my county, and too low for almost the entire State." Indeed, it may be generally said that no particular estimates of the cost of raising sheep and the profits resulting therefrom can be relied on as inducements for others to embark in the business. The broad proposition that the annual profits from raising sheep throughout an entire State are sixty-three per cent must be fallacious. While it may be true that a particular owner, having a vast range very favorably situated, in which two or three thousand can pick up their sustenance,

may find them very profitable, a competing owner in his neighborhood would limit the range, and the profits would diminish. It may be true that small flocks will cost so little to their owner that the profit from them will be "just like picking it up;" but this may not be the case with flocks of two or three hundred animals. It is erroneous to consider sheep-farming, as it must be ordinarily conducted, as a matter of direct profit from the investment of capital. The amount of money which can ordinarily be put into sheep husbandry, with advantage, by one person, is so small that it cannot be properly called an investment of capital. The consideration in growing sheep, except under the purely pastoral system, is not one of direct profit, to be calculated like the dividends from bank stock; but it is the general advantage of combining it with other industries on the farm, of adding to its resources, and of making the *whole* more productive.

The Course recommended for the South.—There are two very distinct branches of the wool-growing industry. One is purely pastoral; having regard only to wool, taking but little account of the value of the mutton, and none of the improvement of the land. It is conducted as an exclusive business in large flocks. The sheep husbandry of Texas, California, and Australia belongs to the purely pastoral system. It is believed by many that the vast region of pine lands in South-Eastern and Southern Georgia, extending from Savannah to the Chattahoochee, comprising about ten million acres, now practically unoccupied, constitutes a natural pasture, upon which a million of sheep could be raised at a trifling expense. This is the opinion of the Commissioner of Agriculture of the State.

Col. Richard Peters, of Atlanta, Georgia, admitted to be the highest authority on sheep husbandry in the State, in his original communication, elsewhere given at length, speaks of this district as follows:—

"Across the entire width of the State, there is a belt of country of an extent northward from the coast and the Florida line, say from a hundred to one hundred and fifty miles. It is the land of the long-leaf

pine and the wire grass. Flocks of native sheep, as high as thirty-five hundred in number, are found here and there, scattered over the surface, receiving but little care or attention, except at the annual gathering for shearing and marking. Very little can be said either for the quantity or quality of the wool raised there. I am aware that it has been claimed for this section that its present advantages are as great for large flocks as the ranges in Texas and California. I do not subscribe to this opinion. The pasturage of this section, called wire grass, offers fine grazing for sheep in the spring; but, for permanent and continuous food, it cannot be relied on. A fair experiment in sheep-raising, uniting good attention, selection, and crossing, with a determination to secure the best development in frame and fleece, has not been made in this section for many years. If it were properly attempted, by combining Bermuda with the wire grass for spring and summer pasture, and red winter oats for one or two months in winter, for the ewes and lambs, I think the results would prove of the most satisfactory and profitable character."

General Young, of North Carolina, who, as a practical wool manufacturer, speaks with much weight, is more sanguine than Mr. Peters as to the capacity of the lower region for sheep husbandry. He says that, in the tide-water regions, "the sheep find a sustaining pasturage, the entire year, upon the wire grass which grows spontaneously through the otherwise barren pine forests. Being thus independent of their owners, they keep in uniform good flesh, grow to better maturity, and furnish better fleeces than in the upper portions of the State." By the statements of General Gordon and others, it appears that immense tracts of these lands can be obtained at from fifty cents to one dollar an acre. Having been burned over in former times by the Indians, they are free from underbrush. There is no necessity of clearing the land, as the pines may be destroyed by girdling. The land can be prepared for the required pasturage of winter oats, simply by harrowing. A great advantage of these more southerly localities is the facility for supplying early lambs for the northern markets. Even Texan flockmasters with whom we have conversed admit the advantages of these lands for sheep-growing on a large scale.

When intelligent sheep-farming is practised on these now waste pine lands, it is believed that it will develop a value in them never yet conceived of. Sheep-farming has made the chalky downs of England, once arid wastes, gardens of verdure. There are no soils so responsive to manure as those of a light, sandy character. The most productive lands in all the United States are in Cambridge, Massachusetts, where the writer resides. Originally sandy plains, bearing a few pitch-pines, they have been converted into market gardens. Covered with glass, or hot beds, in the winter, and heaped up with manure when the glass is removed, they bear successive crops through the whole year, and yield as high as four thousand dollars per acre in a year. The Tertiary lands of the South contain many elements wanting in our Northern pine plains (especially in the subsoil), as they contain organic remains. A scientific farmer in Louisiana regards the pine lands, when made rich as they can be with pine straw, folding sheep, and ploughing in green crops to supply organic matter, as the most pleasant lands to cultivate, and the best lands in the State.

It is of such land as this that Longfellow speaks in "Evangeline":—

"Here no stony ground provokes the wrath of farmer,
Smoothly the ploughshare runs through the soil, like a keel through the water."

Sheep for Mixed Husbandry.—The other and more important branch of sheep husbandry, in its relations to the improvement of a country, is that where the culture of sheep is made auxiliary to a mixed husbandry. The highest advantage of this system is the improvement of the land. As this paper may come under the eye of persons less familiar with the subject than our habitual readers, we may be allowed to repeat facts before stated in our pages.

Sheep are the only animals which do not exhaust the land upon which they feed, but permanently improve it. Horned cattle, especially cows in milk, by continued grazing, ultimately exhaust the pastures of their phosphates. In England, the pastures of the county of Chester, famous as a cheese dis-

trict, are kept up only by the constant use of bone dust. Sheep, on the other hand, through the peculiar nutritiousness of their manure, and the facility with which it is distributed, are found to be the most economical and certain means of constantly renewing the productiveness of the land. By the combination of sheep husbandry with wheat-culture, lands in England, which, in the time of Elizabeth, produced, on an average, six and a half bushels of wheat per acre, produce now over thirty bushels. For these reasons, the recent practical writers in the Journal of the Royal Agricultural Society of England, pronounce that, while there is no profit in growing sheep in England simply for their mutton and wool, sheep husbandry is still an indispensable necessity, as the sole means of keeping up the land.

Experience in the United States leads to similar conclusions. Mr. Stilson, of Wisconsin, by keeping sheep, is able to raise his twenty-four bushels of wheat to the acre, while the average yield of wheat in Wisconsin is but ten bushels. There are cases in Vermont where sheep-farmers have been compelled to abandon one farm after another, as they became too fertile for profitable sheep-growing. Mr. George Geddes, whom Horace Greeley used to regard as the highest authority on agricultural matters in the State of New York, and who has raised sheep for many years in connection with wheat, says that, with one sheep to the acre of cultivated land, pasture and meadows, he raises more bushels of grain, on the average, than he did when he had no sheep to manufacture his coarse forage into manure, and to enrich his pastures to prepare them for the grain crop; that the land is constantly improving, and the crop increasing in quantity; and that, while producing crops on less acres and at less cost than he did before he kept sheep, he has, *in addition, the wool and the mutton produced by the sheep.*

Mr. William Chamberlain, of Red Hook, Dutchess County, New York, celebrated as a grower of Silesian sheep, purchased in 1840 a farm in that place of 380 acres, which had been used so long for selling hay that it was worn out. The hay crop, in 1841, was seventeen loads; forty acres of rye gave

ten bushels to the acre; twenty-five acres of corn averaged twenty bushels to the acre; the rest of the farm pastured two horses, four oxen, and one cow. The land was so poor that it would not raise red clover. By using sheep as the producers and manufacturers of manure, he made this worn-out farm so productive that its crops would be satisfactory even in Ohio. The product, in 1866, was 600 tons of hay; 40 acres of Indian corn, yielding 50 bushels to the acre; 30 acres of wheat, averaging 15 bushels; 30 acres of oats, 8 acres of roots, and the pasturage of 300 sheep, and of the teams, cows, &c., necessary to carry on the farm and to supply the families on it with milk and butter.

Mr. Chamberlain's plan, when he first commenced making manure by using sheep, was to spread it thinly, so as to go over all the surface he could, and make clover grass; and he said that, when he had brought his land to where it would produce clover, improvement henceforth was easy and rapid. The sheep not only gave the first impulse, but were all the time depended upon as the great manure-producing power.

Now all this can be done by sheep at the South. By their use, even red clover, the grand ameliorator of land (which it was once declared could not be grown at the South), can be made to have the same regenerating influence which it has at the North. Even in Mississippi, as Dr. Phares has asserted and proved, red clover may be grown as promptly and as luxuriantly, and yield as heavy crops of forage, as in any portion of America.

Many of the most intelligent men of the South believe that the *exclusive* cultivation of cotton has been a scourge, instead of a blessing, to their country: that, with a crop of over 500,000 bales of cotton, — worth, at 15 cents a pound, \$75 per bale, — in one State, Georgia, its agricultural population, as a whole, were poorer at the end than at the beginning of the year: that labor on a cotton plantation where a fall crop is planted is without intermission; and that it is excessive in the quantity required, often exceeding in cost the whole salable value of the plantation: that such is the demand for labor in those sections in which exclusive cotton culture

is practised, that the planter is compelled to take any labor that offers, whether good, bad, or indifferent; and thus the exclusive cotton-planter belongs to the negro, as the negro once belonged to him: that, if but half the usual quantity of cotton were planted, the value of the crop would be about the same, and but half the labor would be required: that by high farming, or cultivating with the plough, fewer acres, and those only which can be heavily manured, greater results may be obtained with diminished labor, the cost being rather in the manure than in the cultivation; and that high farming would be remunerative in the cotton States, with the triple effect of improving the soil, increasing profits, and diminishing, and therefore controlling and improving, the labor. None of the language in the above paragraphs is our own: it is literally taken from Southern writers.

If they speak correctly, and the Southern landholder must cultivate only the small proportion of land which he can manure heavily, what is to become of the rest of it? The only answer is: The rest may be devoted to small grains, to meadow and pasture. To utilize the meadow and pasture, sheep can be more profitably used at the South than any other stock. Cattle can be better raised at the West. Dairy and cheese farming are more difficult and more laborious than sheep farming. Sheep culture has other advantages over cattle-raising. It gives annual dividends in the fleeces. Indeed, the ewe gives two dividends, — her fleeces and her lambs. The beef-producing animals give no dividends; and the grower must go on adding his expenses till the end of their lives, when he must find his compensation (if he can) in one gross sum. The capital required for the purchase of sheep — enough stock for a fair trial — is small. Large flocks are not required.

Sheep-growing is commended by other considerations, apparently slight, but too important to be overlooked. Wool never has to seek a purchaser. Poor or good, it is eminently the cash article on the farm. The little addition from this source to the resources of the farm affords a satisfaction to which every wool-growing farmer will testify. The absolute

enjoyment the farmer has in the care of his flocks is no little consideration; neither is the gentle and humanizing influence, which a love for animals is well known to exert, to be overlooked. If the prejudice still lingers that sheep culture is a less dignified occupation than that of cotton-planting, it should be dispelled. The nobility of sheep-growing, and especially of sheep-breeding, is recognized by all the advanced nations. The Empress Eugenie took the flock of Rambouillet under her special protection. France has recently erected a monument to Daubenton, who first showed how the culture of the merino could be made successful. The Queen of England takes pride in the choice flocks which adorn her parks. The first exhibitor of wools at our Centennial was an archduchess. The princes of Hungary are as proud of the fineness of their wools as of their own descent. The English nobleman values the prizes for his perfected South Downs or Lincolns above all the honors of the turf; and, at a dinner of the landed gentry, the topic of sheep and turnips takes precedence of all other table-talk. With such recognitions, sheep husbandry has no need of urging its claims to a place of honor on the plantation of the South.

Precisely how sheep-farming in connection with the cotton culture is to be carried on, we would not presume to indicate. Fortunately, we have a Southern man — Mr. Howard, before quoted, and whose high authority as a scientific and practical farmer is well recognized in Georgia — to illustrate the application of diversified husbandry to the cotton culture. He submits the following rotation of crops, in connection with sheep-growing, as suited to the agricultural condition of the South: —

“We will suppose a farm of 500 acres of open land under fence. Let 250 acres be devoted to arable purposes, and the rest to grazing. The rotation might be as follows: 1, Cotton and corn, in the same field, in suitable proportions; 2, oats, sown in August, on the cotton and corn land; 3, rye, or rye and wheat, sown in September, the land having been twice ploughed, in order to kill the permanent oats; 4 and 5, clover, if the land is in sufficient heart to produce it; if not, the fourth year rest ungrazed, and the fifth year sheep and cattle penned

upon it; every night during the year, using a portable fence. An ordinary farm of 500 acres will support 500 sheep, besides the crops in the above rotation. The oats and rye will feed them during the winter nearly or entirely without injury to the grain. Five hands would be sufficient to work such a farm and take care of the live-stock.

“During the first year, the following results might be expected from an ordinary farm without manure:—

25 acres in cotton, 12 bags, at 15 cents	\$900.00
25 acres in corn, 250 bushels, at \$1	250.00
50 acres in oats, 500 bushels, at 80 cents	400.00
25 acres in rye, 200 bushels, at \$1	200.00
25 acres in wheat, 150 bushels, at \$1.50	225.00
Increase and mutton sales of 500 sheep	500.00
Wool, 3 pounds per head, at 33 cents per pound	500.00
Manure, at \$1 per head	500.00
	<hr/>
	\$3,475 00

“Separately, each of these products is small; still the aggregate result is more than \$600 per hand. Yet this is nearly three times the average product per hand in the cotton States.

“The farm products given in the case above supposed are the result of the first year’s rotation. The next year, the cotton and the corn would be more than double, by penning 500 sheep at night on 50 acres. It is the writer’s experience that 10 sheep, regularly penned, will manure 50 acres. Two hundred would therefore manure, well, 50 acres. The appearance of the ground would not indicate this high manuring; but it should be remembered, that liquid manure (which is equal in value to the solid) is not visible. . . . At the end of the fifth year of this rotation, the change in the farm would be equal almost to a transformation; the crops having doubled or trebled, without (which is a most important point) any material increase of labor or other expense.”

The accuracy of the estimates above given, we do not vouch for. As we have said before, all definite estimates of profits in any industry are liable to be fallacious. They are submitted only for illustration. The best hand-books of art can do hardly any thing more than suggest, and excite the reader to apply his own intelligence to the particular problem which he desires to solve. The more general statement of another, Mr. Peters, may be more safe. He is experienced in

sheep, and commends their employment in connection with the culture of cotton. He says:—

“In the middle part of the State of Georgia, the Bermuda grass prevails; and, under the cotton system of culture, it was the dread and bane of the planter: but now, for its nutritious qualities and compactness of sod, it is considered by our people as valuable and reliable as any grass, not excepting the Kentucky blue grass. It will offer sheep the very best of pasturage for six months of the year, in this section of the State; and, if managed as on the pastures of Kentucky, for the entire year. In Putnam, Hancock, Wilkes, and adjoining counties (formerly the *el dorado* cotton country of Georgia), where the Bermuda has taken possession, there is a future for successful sheep husbandry: providing, of course, the supervision be intelligent, and the business properly conducted, and combined with cotton culture, the result must prove highly remunerative, — far surpassing any thing in the past history of this industry in New England or the Middle States.”

In regard to the general culture of sheep at the South, independently of its relation to any particular locality, he observes:—

“In reference to the whole matter of sheep husbandry at the South, in which neither labor, care, nor expense has been spared by me, I may say with safety: I know of no investment so likely to yield constant and profitable return to the farmer; and, certainly, none so valuable to the acres he occupies. I think the State of Georgia, from its varied climate, soil, and surface, offers unequalled facilities for this industry.

“My own experience has been to a great extent in North or upper Georgia, in Gordon County. The country is hill and valley, the land changing very rapidly; the pasturage, sedge, crab, and other native grasses. Of the cultivated, the orchard grass, red and white clover, on the upland, and red top, on low land, succeed admirably. Lucerne and German millet are never-failing sources of an ample supply of hay. The former afford from four to five cuttings in a season. Red, rust-proof oats — a variety reliable in winter, if sown in September — can be pastured during the winter and early spring, and then yield a full crop of grain. The same may be said of barley, rye, and wheat.

"The breeds I have tested are the Spanish and French merinos, South Downs, Oxfordshire Down, Leicester, Asiatic broad-tail, or Tunsian, Improved Kentucky Cotswold, and native sheep. I have also crossed nearly all of these varieties. Those between the Spanish merinos and native, and the Cotswold and native, have proved most profitable. My present varieties are the thorough-bred merinos and Cotswolds, and crosses between these two.

"For general purposes of wool and mutton, I recommend most decidedly the cross from the native ewes and Spanish merino bucks; the progeny showing marked improvement, having constitution, fattening properties, thriftiness, and a close, compact fleece.

"If the winters are mild, my flocks require feeding about thirty days; if cold and wet, twice that time. My merino sheep are very healthy. They have had trouble with the sheep bot-fly; but I have found a liberal use of tar a perfect preventive.

"In all well selected and well managed flocks, the increase and manure will amply pay all expenses, and leave the fleece clear profit. The fleeces of my flocks, not housed at night, will give an average of seven pounds of wool to the head.

"The future history of the sheep husbandry of this State, if intelligently pursued in accordance with its natural divisions, will show three distinct systems; that of Northern Georgia will somewhat resemble the industry in Ohio, Pennsylvania, New York, and New England; that of the middle of the State, Kentucky; and that of the Southern portion (with shepherds and dogs), Texas, Colorado, and California."

In order that Southern gentlemen who may see this paper should have the views of a thoroughly practical farmer and expert in sheep husbandry at the North, we have requested Mr. William G. Markham, of Avon, New York, President of the New York State Wool-Growers' Association, and Secretary of the National Wool-Growers' Association of the United States (whom we have had the privilege of consulting daily during the preparation of this paper), to give some suggestions in furtherance of the object of improving and extending sheep culture at the South, and particularly as to the breed of sheep most desirable in that section. He has replied to this request as follows:—

AVON, NEW YORK, April 21, 1878.

DEAR SIR,— You ask my views of improved sheep husbandry, and its adaptability to the South. My personal experience as a breeder of sheep has been mainly with American merinos, in Western New York; though I have bred Cotswolds and other long-wool varieties to some extent.

In my immediate vicinity are some of the most skilful and successful breeders of American merinos in this country. I have at all times been quite familiar with their flocks, and watched with greatest care and interest the results of the different experiments in management and breeding.

The little, light-fleeced foreigners imported from Spain, between A.D. 1800 and 1813, by Colonel Humphreys, Consul Jarvis, and others, were transformed by Messrs. Atwood of Connecticut, Hammond of Vermont, and others, into a type of sheep so far superior, in constitution, form, and weight of fleece, and altogether so widely different from the original importation, as to be regarded a distinct variety; and, in justice to our breeders, the word *Spanish* was dropped, and the term *American* merinos applied to them.

To continue this improvement in our stud flocks, a system for identifying and individualizing the sheep has been inaugurated, by placing a permanent metallic label in the ear of each sheep, containing its flock number; and an accurate record is made of the general characteristics of each sheep, giving weight of fleece, length and quality of staple, form, and breeding qualities, &c., and preserving the pedigree of each individual for a public register. This additional care has enabled our breeders to attain greater and more valuable fleeces than ever before produced from this variety of sheep. Our flocks are small, usually containing from fifty to one hundred breeding ewes: the clip of which will, in some instances, average upwards of fifteen pounds each, while selections of ewes not in breeding often shear as high as eighteen to twenty-two pounds, unwashed; which scour from six to seven and a half pounds. The live weight of these ewes reaches ninety to one hundred and thirty pounds. The stock rams produce from twenty-six pounds to thirty-six pounds; yielding about the same proportion of scoured wool, weight one hundred and fifty pounds to one hundred and ninety pounds.

And these sheep are the direct descendants, without admixture of other blood, of the importations from Spain prior to 1813, which gave three to five pounds unwashed wool from ewes, and seven to nine pounds from rams.

Our market for these sheep, of late, has been in the South and West; principally California, Colorado, New Mexico, and Texas. It has been the especial study of our breeders to produce such rams as, when crossed upon the common or native sheep of those sections, will produce the most valuable results in wool and mutton.

The great bulk of all wool used is merino clothing wool; requiring strong fibre, of medium length and fineness.

It is unquestionably true, that cultivating the *finest* quality of wool has a tendency to produce effeminacy, resulting in a fine-boned, delicate sheep.

It is also the experience of our breeders that great length of staple is incompatible with density of fleece. In breeding for great length of staple, we do so at a sacrifice of density which, of all characteristics, is most difficult to secure and retain. In no other way can so much be accomplished in this direction as by the use of wrinkly rams.

The most desirable type of sheep for the wool-growing sections of the South and West must possess, *first*, constitution. This implies a broad, deep chest, strong heavy-boned legs, large feet, broad short head and nose, after the bull-dog pattern, and carcass modelled as nearly after a short-horn bull as possible.

In fleece, one of the most important considerations is density: which better protects the sheep from storms, and the wool from dirt; gives greater weight of fleece; and, in hot climates, better protects the yolk necessary for a healthy growth of wool.

It is the impression of our sheep men that Northern sheep, when taken South, shear much lighter fleeces than at home; and that, to keep up the weight of their flocks' fleeces, rams must be bred North.

The fleece should be even over the entire body, covering well the head, legs, and belly; and of medium quality, suitable for clothing wools.

It is the aim of our breeders to furnish rams which will soonest produce this type of sheep when crossed upon the light, dry, thin-fleeced native Mexican and Texas sheep.

Much has been said by wool merchants, and even wool-growers who are ignorant of the true theory of our breeding, against the wrinkly, greasy, dirty-looking modern American merinos.

Even Dr. Randall, — who, in his day, was the highest known authority on sheep matters, — in his "Practical Shepherd" denounced these exaggerated types of this class of sheep as "an unmitigated nuisance;" and yet the experience of the doctor subsequently convinced him that he was in error, and that in no other way could radical defects in a

flock be remedied so advantageously as by the use of a ram possessing the desired characteristics in an exaggerated form. This he freely admitted, and he used upon his own flock of choice-breeding ewes one of the most wrinkly and greasy rams it has ever been my good fortune to see; and this to retrieve what he had lost in density and weight of fleece by the use of long-stapled, plain, fine-fleeced rams.

Breeding improved sheep in Western New York is quite unlike wool-growing in the Southern States. To succeed in either, a uniform supply of nutritious food and drink must be supplied, and sheep kept thriving every day in the year.

In introducing sheep husbandry in the South, where wool is the main object and mutton an auxiliary, the most profitable sheep to breed is unquestionably the type I have described, resulting from a cross of American merino upon the native sheep of the land.

In the vicinity of large towns, where early lambs or mutton may be more profitably grown, the Cotswold should be used upon the second or third cross of merinos upon natives; the Cotswold being more hardy than any other of our mutton sheep, and yet not as hardy as the resultant cross with merinos. In whatever line one is breeding, the SHEEP is of first consideration; second, take care of the *sheep*, and you make a success.

Very truly yours,

WILLIAM G. MARKHAM.

The Culture of Long-woolled Sheep and of other Lanigerous Animals.—The formation of flocks of merino sheep, by grading them up from a foundation of the native stock, is recommended for the greater part of the South, as the chief product will be wool; which, being so easily transportable, can be grown profitably, without reference to accessibility to markets. The vicinity to large cities, unusual railroad facilities, or the command of permanent pastures of unusual richness, admit of another branch of sheep husbandry, in which the principal object is large and early lambs. For this class of sheep husbandry, the English races of sheep—the Leicesters, Lincolns, Cotswolds, and Downs, and varieties of the Cheviot—are specially fitted. An important incident to the culture of these varieties is the production of the long-combing wools now in so great demand for the worsted manufacture. The worsted manufacture of this country, ten years ago of a value not exceeding ten millions, now annually ex-

ceeds twenty millions, of dollars. Our principal supply of these wools formerly came from Canada. Now the production is declining in Canada, and rapidly increasing in the United States. The successful production of the long-combing wools is limited to the populous districts, where there is a demand for mutton, and where there is an improved agriculture. Therefore, while the production of fine merino wools in this country is liable to be affected by the competition of the vast pastoral regions of the Southern Hemisphere, and, without defensive duties, would be certainly overwhelmed, there is no probability of over-production in the growth of combing wool. As a general rule, the English long-woolled races are adapted only for situations where the lands are rich, not subject to drought, fitted for root culture, and where good city markets are easily accessible. It would seem, then, that there are but few situations at the South, or that portion of the Southern country which we have hitherto in view, where the English races could be cultivated to advantage. Mr. Peters is of opinion that the more elevated country of the Southern States is well adapted to these sheep; as, he says, that the influx of the English combing wools "would keep, for many generations, the fair Blue Ridge of the South without sheepwalks, though it is by nature one of the most favored spots in America for this class of wools." A milder climate than that of the North is required for the successful culture of the most important of the long-woolled English races,—the Leicester. The universal testimony at the North is that the climate, generally, is too severe for the Leicesters, and therefore the hardier Cotswolds are preferred. Leicester wools, pronounced to be equal to the best English, have been produced in Ohio, on the southern border of Lake Erie. But the climate is modified by the lake, and this is peculiarly a region of the vine. The wool of the Cotswold is too coarse for many worsted fabrics, and has neither the fineness nor the lustre of the Leicester. Greater fineness in the Cotswold fleece may be produced, as has been done in Kentucky and Tennessee, by a slight infusion of merino blood; but the highly important quality of lustre, such as is wanted for

the so-called black mohair and brilliantine fabrics, can be imparted only by Leicester or Lincoln blood. Besides, the Leicester is the most valuable of all mutton sheep for crossing, and imparts its precocity, — that is, its capacity of fattening in one year, and of reaching full growth in two years, — and, therefore, its mutton-producing capacity, to all other races. Where there are rich, sweet pastures, with quantity in a small space, and a moderate climate, the Leicester will thrive. Such localities must exist at least in Kentucky or Tennessee, and there the Leicester should be introduced.

Kentucky Sheep. — Whatever may be the possibilities of the Blue Ridge region for growing the long-woolled races, the ultra-montane regions of Tennessee, and especially Kentucky, are the only fields at the South where actual success has been achieved on any considerable scale. This may be due to geological formations existing in those States. It has been observed, that the geological map of England exhibits an exact chart of the distribution of British sheep; and Professor Shaler, the able Professor of Geology at Harvard College, has observed to the writer, that the capacity of Kentucky for mutton-sheep husbandry is strictly limited by the geological features of that State. Kentucky mutton, produced by her long-woolled sheep, invariably appears in the choice *menus* of city hotels at the North. Its consumption is enormous. There are stalls at the Faneuil Hall Market, in Boston, where nothing is sold but Kentucky mutton.

We have obtained the following statement from an intelligent gentleman in Boston* : —

Boston, April 19, 1878.

I have not forgotten your request in regard to Kentucky sheep. Through an introduction from Mr. Terry, the inspector of provisions, I have been placed in communication with the two largest dealers in mutton in this city.

Yesterday afternoon, I went to the abbatoir in Brighton, and saw both of these gentlemen, from whom I obtained the following facts : —

During the year ending May 1, 1877, 272,000 sheep and lambs were slaughtered at the Brighton abbatoir. This supplies the Bos-

* William A. Hayes, Jr., Counsellor-at-law, No. 41 Sears Building, Boston.

ton market, the neighboring towns, and many of them are sent to the surrounding cities, — Portsmouth, Concord, Fall River, and Manchester. There are, of course, a large number of dressed sheep sent to the Boston market from other places, not included in this number.

In regard to Kentucky sheep, my informant — one of the gentlemen referred to, who does not desire his name to be published — tells me that about 20,000 are annually sent to this market. This includes, as I understand, all the sheep from Kentucky. Before the war, the sheep sent from this State, though less in number, were superior to those now sent; being almost all full-blooded Leicesters, Cotswolds, or South Downs. Lately, many of these long-woolled sheep have been crossed with the native mountain or "Tennessee ewes," which are of an inferior grade. The principal supply of sheep for this market, from Kentucky, comes from four counties [of course, the blue-grass counties. — *Ed.*].

The first-class Kentucky sheep will weigh about 150 pounds. Lots will average from 125 to 150 pounds. Kentucky sheep, dressed, bring two dollars per hundred more than ordinary sheep.

The price of Kentucky lambs is as follows: from June 1st to July 1st, about eight cents; from July 1st to August 1st, about seven cents. The sheep average about six cents, live weight. Ordinary New-England sheep average about four and a half cents, live weight.

My informant says that many of his best sheep come from Ohio and Canada.

I saw, in the pens at Brighton, some very fine Kentucky sheep, just received, and some excellent sheep from Michigan. In the latter State, the merino is crossed with a long-woolled sheep, which increases the size of the animal, and improves the mutton.

My informant has agents in various parts of the country, — in Covington, St. Louis, Ohio, and other places; and does an immense business, amounting in one year as high as 245,000 sheep. He thinks that the national encouragement of sheep and wool production will lead to an immense export of mutton, and that we shall supply England and the rest of Europe with all that they can take. Since December 1st, he has killed and exported from New York 2,500 sheep per week. He predicts, that, in the course of a few years, the character of the business will change in Boston, and will become like that of Chicago; the "tail end" only of the supply remaining here, the best animals being exported to Europe. He also, without any suggestion from me, stated that the South is to become a great sheep-producing country; and that there sheep could be produced more cheaply than in Ohio and the West.

Connected with the slaughter-houses at Brighton are immense refrigerators, where the animals slaughtered can be kept for a long time. The same system is now introduced on board ship, rendering the transportation of fresh meat a very easy matter.

I was astonished at the extent of the abattoir, and the system which pervades the establishment. There is nothing lost, and the greatest cleanliness prevails. The hoofs and shin-bones, after having the oil extracted from them, are sent to Europe, and used in the manufacture of buttons, &c. The fat is tried out in large boilers, and converted into tallow. The blood and scraps of meat are dried, and the heads ground into bone-dust; the whole being converted into the Stockbridge fertilizers, which are manufactured in a large building near the abattoir. All disagreeable fumes arising from the rendering process are conducted into a large chimney, and there consumed. Nothing goes into the river but pure water.

I may mention, that I saw two or three sheep wandering about the yards, apparently quite at home and very tame. These, I was informed, were "flock leaders," and used to lead the flocks of sheep which come by the cars, to any desired place. They are thoroughly trained, and are considered very valuable.

The peculiar capacity for growing mutton sheep in certain parts of Kentucky is given by the limestone soils, which produce permanent pastures of the nutritious blue grass. Indeed, large size in all animals is a characteristic of this country. This has been attributed to the calcareous character of the soil, which, supplying material for bone, favors the enlargement of the skeletons of all animals. The reports to the Agricultural Department say that no property in Kentucky pays better than sheep. One correspondent says, that "the best results are from grades of the native with the full-blooded Cotswold breed. Three crosses will make a good flock. Full bloods do not herd well. Only a small number can be kept together, — say thirty. If large, the flocks of full-bloods deteriorate." This corresponds with the experience in Canada. The enormous production of Canada long-combing wools is furnished by flocks of from twenty to fifty head, very rarely equalling that number. The most profitable mutton sheep is said by another correspondent to be the Cotswold crossed with the Southdown.

A correspondent from Trumble County makes the following statement:—

“ We feed only when the snow is deep; the balance of the winter sheep do well on blue grass. There are no wild grasses in the county.

“ The following are the results with a flock of sixty good sheep:—

59 Cotswold ewes, which cost \$8 per head	\$472.00
One buck cost \$25	25.00
Feed in the winter, 3 tons of hay	24.00
Pasturage in summer, \$1 per head	60.00
Salt	1.00
Shearing per head, 10 cents	6.00
For attending to flock	20.00
Total cost	\$608 00
Clip per head, 6 pounds at 30 cents	\$180.00
58 lambs, at \$4 per head	232.00
Manure from 60 head of sheep	30.00
	\$442.00
By deducting the cost of keeping the sheep	\$136.00
Leaves	\$300.00
The net profit on an investment of \$497.00.”	

The most eminent breeder in Kentucky of the long-woolled sheep is Mr. Robert W. Scott, of Kentucky, who claims to have created a new permanent race, which bears the name of “improved Kentucky.” From the published accounts which Mr. Scott has given of his procedure in creating this breed, it appears that the object he had in view was to obtain the form and delicacy of mutton of the Southdown, and the weight and length of fleece of the Cotswold, with the thickness and softness of the merino. His method was the infusion, from time to time, of the blood of each of these races, according to the quality which he desired to have predominate. Although it is not in accordance with the generally recognized principles of zoötechny that a permanent race could be thus created, having the best attributes of all its ancestors, as there is constant tendency to reversion to the strongest race, Mr. Scott claims that his breed has become permanent, constantly reproducing itself; that, in 1866, the sheep had become essen-

tially alike and uniform, maintaining their identity and imparting their qualities as surely as any other breed. So highly are they esteemed that he has found ready sale for all that he could produce from a flock of a hundred ewes, at the uniform price of thirty dollars. He claims that they are peculiarly adapted to the South, as they need no housing. They are able to face the bleakest winter in Kentucky, without any protection.

The great Silurian limestone basin of Middle Tennessee would seem to possess equal advantages with the last-named State for growing the long-woolled sheep. Mr. Killebrew, Commissioner of Agriculture of the State of Tennessee, in the advance sheets from a work on Sheep Husbandry, just published by him, thus describes this district:—

“There the meadows are luxuriant, the pastures are green, the soil is fertile, the water abundant. . . . There all the grasses flourish; even the loftiest hills are set in blue grass, and countless flocks fleck the landscape on every side. The highest evidence that can be adduced as to the value of this basin for sheep-raising lies in the fact, that sheep are grown upon nearly every farm, and, up to a certain number, are universally held to be profitable. Sheep require no feeding in this division during winter, when upon good grass, barley, wheat, or rye fields, except when there is a fall of snow. Then some oats, fodder, or corn is fed. They are very healthy; and, indeed, when attended to, prove a most profitable investment, up to a certain number,—say one sheep for every five acres of open land, or two sheep on every acre of permanent pasture, presuming that the farmer will have other stock in proportion to the size of his farm.

“The cost of keeping sheep per annum is about \$1.25. The wool of one sheep of high grade will about pay for the keeping of two. Lambs are a clear profit, and the estimated cost of wool is below ten cents per pound. The average yield of wool for improved lands in this basin is between seven and eight pounds. Nearly all the natives have disappeared from this locality, and high grades have taken their place. Mutton sheep, near Nashville, good grades, bring in the market five cents per pound, gross; lambs, grade, three and a half to four and a half dollars. A large trade in lambs has been built up within a few years past. Hundreds of car-loads are shipped every spring from this basin to points North, and good prices realized. Good sheep-farms

can be bought in the basin for twenty to forty dollars per acre, varying according to the situation and soil."

Mr. Killebrew publishes a letter addressed to him by Mr. Tom Crutchfield, of East Tennessee, a successful sheep farmer; from which we quote the following:—

"In 1864, I purchased a lot of native ewes; and was fortunate in getting the use of a superior Spanish merino ram, bred by R. Peters, of Atlanta, Georgia, to cross upon them: which cross gave great improvement in carcass, form, and fleece; covering the naked places of the natives, and making the fleece much more dense, and the fibre finer and stronger.

"I saved the ewe lambs of the cross, and bred them to an improved Kentucky buck, bred by Robert W. Scott, of Frankfort, Kentucky, which increased the size of carcass, and gave greater length and yield of wool.

"The ewe lambs of her get were bred to the best Cotswold buck I could procure, American bred and imported; never using one buck longer than two years, and never breeding in and in. In the mean time, I have added to my flock, American bred and imported Cotswold ewes, at heavy cost, breeding them to the same bucks.

"The imported and American-bred Cotswolds, and their offspring, are not superior, either in carcass or fleece, to those of my own breeding. I clipped samples of wool from Prince of Wales, an imported English-bred buck, and also from a ewe of my own breeding, which, through several generations, could be traced back through the merino cross to the native. I sent these samples to my wool-merchants in Boston, Mass., with history, and requested their opinion of the wool, on its merits. They pronounced the ewes' wool superior to the bucks'. It was equally as good combing wool, eighteen inches long; was of finer and stronger fibre, soft to the touch, attributable to the shade of merino in it.

"The effects of cross to the Spanish merino, in fineness and softness of fibre, and density of fleece, and strength of staple, remain for many generations. I cull my ewes annually, at shearing time, marking all that are deficient in form or fleece, or that are becoming aged; and set them apart with the wethers for mutton, which are sold the following spring, often taking a better price than ordinary sheep, because they gross less and are better mutton.

"I sold a lot last spring (fattened principally on grass) to the

butchers of Chattanooga, that averaged 166 $\frac{3}{4}$ pounds gross; having clipped an average of ten and three-quarter pounds of nice combing wool, which sold at thirty-seven and one-half cents per pound. The price for them was six cents per pound gross, netting me \$14 per head; while the market for ordinary mutton was four cents. They grossed less than one-third, and were sold for fifteen cents per pound net."

Mr. John W. Bowen, of Smith County, Tennessee, a blue-grass district, in a report to the Patrons of Husbandry, published in the "Rural Sun," gives the experience of farmers of the county in raising long-woolled sheep. One farmer says: "My experience is that one acre of average pasture will feed three sheep. My sheep net me always fifty per cent. I like the Leicester and Cotswold crossed; I should prefer the Leicester." Another says: "Two dollars on the sheep, after deducting all expenses of every kind, is the least any one ought to expect as the annual profit. As to breeds, I like the Leicester best, the Cotswold next, and the South Down next."

Even in countries so favorably situated as Tennessee and Kentucky, the culture of the long-woolled sheep can be profitably carried on, only as an adjunct to other husbandry. The Agricultural Commissioner of Tennessee gives this sensible advice: —

"Farmers, as a rule, should not go into sheep husbandry to the neglect of other things. Let sheep be *one* of the products of the farm, not the *only* product. A few sheep, well cared for, will prove profitable to every farmer; while a large flock would become, in nine cases out of ten, a source of annoyance and expense. The object of this paper is to show the profitableness of sheep-raising on a small scale. I do not advise the keeping of large flocks by the generality of farmers. If every farmer should carry a small flock, breeding up the natives to high grades, the profits would be very much increased."

We agree so heartily with this opinion that we hesitate to recommend, at present, the introduction on a large scale, even in districts favorably situated, of another race producing combing wool and mutton, the Cheviot, which has received scarcely any attention in this country. The exceeding hardness of

this race, which, according to British writers, "is certainly the most convenient sheep, as he will thrive anywhere, on much or little, in mountain storm or by dreamy mansion;" the acknowledged fact, that, of all English races, "the Cheviot has the best general mutton and wool;" the fact that the county of Northumberland, the home of the race, containing 1,250,000 acres, and having one sheep to every one and a quarter acres, has a physical aspect corresponding to regions in the Blue Ridge and Tennessee, being largely occupied with mountains rising to a height of two thousand feet, — has led to the opinion, that the Cheviots are peculiarly adapted to the slopes and plateaus, or tablelands, of the Blue Ridge and the Cumberland Mountains. One intelligent correspondent, Col. Watts, of South Carolina, speaking of sheep adapted to the Blue Ridge region, says: "I should also strongly recommend the Cheviot, so successful in the districts of England and Scotland, of similar altitude and climate." We know nothing to oppose this opinion, which appears quite reasonable. But no experiments have yet been made with the Cheviots in these localities; nor have any judiciously conducted experiments with the native or merino sheep, in large flocks, been made. There have been several attempts at sheep-growing on a large scale, on the Cumberland tableland, at an elevation of two thousand feet; where, in the summer months, the land is covered with tussocks of nutritious mountain grass, furnishing a sufficient sustenance for eight months in the year. As no attention was given to providing forage in the winter for these flocks, the enterprise, of course, ignominiously failed.

For the benefit of those who may possibly contemplate a trial of the Cheviots, it may be said, that, in the counties in England and Scotland producing these sheep, the sheep-farms are commonly about 2,000 acres in extent. In general, only a small part of the farm is cultivated (rarely more than fifty to one hundred acres), and that only for winter food for the sheep. Although bred in purely pastoral regions, they are grown primarily for mutton; which, when fattened, is held in the highest estimation. The breeder in the mountains,

however, rarely fattens his sheep or lambs for market. They are turned over, at different ages, in different districts, to be fattened by the farmer of the arable lands, and lower and richer pastures. In the more southerly counties, the increase of a flock of a thousand sheep is sold as lambs. Their sale, with the fleeces, make the whole return of the flock. But the culture of flocks of this or any other race, on a large scale, upon the elevated regions of the South, cannot be recommended at present. It must be the outgrowth of a general and more modest system of sheep husbandry.

We must not pass from the mutton sheep, without referring to a race which seems to be peculiarly adapted to the South, and is hardly known at the North: we refer to the broad-tailed sheep of Africa and Asia Minor. Colonel Watts, of South Carolina, the most experienced flock-master of that State, recommends the culture on the rich bottom-lands of the southern coast, of the African broad-tail, or a cross with the Cotswold. After speaking of the actual tests which he had made of all the principal wool and mutton breeds, including the one last mentioned, he says: "If the principal object should be to raise mutton for the market, I would certainly recommend the African broad-tailed sheep; because they mature earlier. . . . Were the question one of long-combing wool, I would cross the Cotswold ewes with the African broad-tailed ram, for all the range of country this side of the Blue Ridge." These statements are exceedingly interesting. They show the possession of a resource for mutton and wool at the South not generally supposed to exist in this country. This race is the oldest known. It is the sheep of Syria and the Bible, — the race to which belonged the Paschal lamb; and should be cherished for its associations, if for nothing else. But travellers speak of the flesh of the animal, when well bred and fed, as "superior to that of any breed on the face of the earth." Its wool furnishes that strong and bright fibre found in the rich Persian and Turkish carpets. It is a natural combing wool; and the cross referred to might impart brightness, and strength of staple, to the Cotswold fleece.

The Angora Goat. — Our Southern correspondents, Mr. Pe-

ters and Mr. Watts, give us some original contributions in relation to the culture of the Angora goat, derived from their own experience, which show that the mountain range of the Blue Ridge is peculiarly adapted to this interesting lanigerous animal. Before quoting from these gentlemen, we may appropriately show the uses to which the fleeces of the Angora goat may be applied, as stated in the Report of the judges on Wool at the International Exhibition of 1876.

“Mohair, the fleece of the Angora goat, is not a mere substitute for wool, but occupies its own place in the textile fabrics. It has the aspect, feel, and lustre of silk, without its suppleness. It differs materially from wool in the want of the felting quality; so that the stuffs made of it have the fibres distinctly separated, and are always brilliant. On account of the stiffness of the fibre, it is rarely woven alone; that is, when it is used for the filling, the warp is usually of cotton, silk, or wool, or the reverse. The distinguishing qualities of the fibre are lustre, elasticity, and wonderful durability. The qualities of lustre and durability, particularly, fit this material for its chief use,—the manufacture of Utrecht velvets, commonly called ‘furniture plush,’ the finest qualities of which are composed principally of mohair, the pile being formed of mohair warps, which are cut in the same manner as silk warps in velvets. Upon passing the finger lightly over the best Utrecht velvets, the rigidity and elasticity of the fibre will be distinctly perceived. The fibre springs back to its original uprightness, when the pressure is removed. The best mohair plushes are almost indestructible; and are now in general use by all the principal railroads, as the most enduring of all coverings for railroad seats. The English have attained the greatest success in spinning mohair, and the French and German manufacturers use English yarns. . . . Another analogous application of mohair is for forming the pile of imitation seal-skins. Some of these fabrics, exhibited by manufacturers of Huddersfield, England, were of striking beauty; the resemblance to seal fur being quite striking. . . . Mohair forms an essential material for the best carriage and lap robes, with a long and lustrous pile. Some exhibited were made to resemble the skins of tigers, leopards, and other animals. . . . Another application of mohair is for the fabrication of braids for binding, which have the lustre of silk, but far greater durability. . . . Still another important application of this material is the fabrication of black dress goods, resembling alpacas; the mohair being woven with

cotton warps. They are called mohair lustres or brilliantines. Beautiful exhibits of this admirable fabric were made by the Arlington Mills and the Farr Alpaca Company, of Massachusetts. Mohair is also used in France in the manufacture of laces, which are substituted for the silk laces of Valenciennes and Chantilly."

So numerous are the applications of this material that, so soon as a sufficient domestic supply is assured, the manufacture will have a great extension in this country, furnishing a home market for all that can be produced; although it must be admitted that its use at present is comparatively small. The total production of mohair in the world, as shown by the imports into Europe—a very little as yet being imported into this country—in 1876, was, according to the Messrs. Burnes, four and three-fourths millions. Formerly, it was all produced in Asia Minor. Recently, the Angora goat has been acclimatized in the colony of the Cape of Good Hope; which exported, in 1876, one and a quarter million pounds,—a fact which stimulates growers here. The average price last year was thirty-seven pence,—about twice that of the best Lincoln hogget wool. That of alpaca fell as low as twenty and a half pence. The Angora, therefore, is by far the most valuable of all lanigerous animals; not even excepting the famous Cashmere goat, which produces only two or three ounces, to the animal, of the *pushm*, or fine wool used for making India shawls.

As to the adaptability of the culture of this invaluable animal to the elevated regions of the South, Mr. Peters says:—

"I have owned these animals (Angora goats) from six distinct importations; those brought over by Dr. J. B. Davis, in 1848, proving to be superior in many respects to any of the more recent importations. One of the most valuable, interesting, and remarkable traits of the Angoras is the rapidity with which fleece-bearing goats can be obtained by using thorough-bred bucks to cross on the common short-horned ewe-goats of the country. The second cross produces a goat with a skin valued for rugs, mats, and gloves. The fifth cross (known by many breeders as full blood) will yield a fleece not inferior to much of the mohair imported from Asia Minor. The fifth cross can be read-

ily obtained in five or six years. Thorough-bred bucks should always be used, because the progeny of the so-called 'full-blood' bucks vary greatly, and the upward progress is by no means satisfactory. The Angora is a hardy, industrious, and self-sustaining animal, and can be classed as herbivorous. Being active and vigorous, they roam over wide ranges of country, giving value to worthless vegetation refused by most other animals; and will feed and fatten at double the distance from water that sheep can, as they travel faster and endure more. I have, for twenty years, bred them largely, and have observed the following rules in my selection of stock bucks:—

"*In pedigree*, dating back to Asiatic importation.

"*In fleece*, weight and length of the long, silky, ringletted, white fleece, and its freedom from kemp, and mane on the back and neck.

"*In form*, size and vigor, long, pendant ears, and upright, spiral horns.

"If that point has not been already reached, I believe it will be, when, (as in the history of the merino sheep) finer specimens of the Angora, American bred, may be seen here than can be found in their haunts in Asia Minor."

"I have had great success with the Angoras, and regard them as one of the most valuable acquisitions to the resources of our husbandry. They have yielded me more substantial pecuniary benefit than any branch of my extended stock investments. In 1861, I sent out to Wm. M. Landrum, of California, the first Angoras that went there; where they have laid the foundation of what, I am confident, will be a very extensive and profitable husbandry. There can be no doubt that, in the range of the Blue Ridge, extending from Alabama to Virginia, they would find all the requirements of their nature, utilize a vast country, and prove a source of great benefit and profit to all interested."

Colonel Watts, on the same subject, uses these words:—

"Let me say, in view of the industrial wants of the country, I think this last-named section of our State [South Carolina], the Blue Ridge mountains, can, with moderate care and expense, most successfully find all the facilities needed for the best combing wools and the Alpaca and Angora goat. In fact, I have no doubt on this point. Even here, seventy-five miles from the mountains, I have, for six years, grown most successfully the Angora goat; whose flesh I regard as superior to any mutton, and whose fleece, properly handled, could there be made more profitable than any wool-growing. This I can say from actual, careful experience with Angoras of the Asia Minor stock, meeting here

few obstacles to their profitable breeding; and which, in the Blue Ridge beyond me, would find an exact counterpart of their native soil and climate."

"Aside from their flesh and wool, there is another advantage which they offer, which, in the mountains beyond, would be most valuable. In a cross I have made with a pure Angora buck and a Maltese ewe-goat, I have raised a ewe-goat that will give four quarts of as good milk as any cow on my plantation. The feed of one of my cows will keep twelve goats. My cows must have certain food, or they will not thrive. My goats will eat any thing almost, and do well; and with this advantage, also, that their milk and butter are not in any way affected by their diet.

"It is not, therefore, at all an open question with me, after years of practical experience, whether the Angora and kindred races of the goat tribe would thrive on our Blue Ridge. They would be more profitable in that locality than any other husbandry."

In confirmation of the value of one fact, among many others, mentioned by Colonel Watts, it may be remarked that the reports of the Society of Acclimation of France, upon this animal, dwell specially upon the importance of giving milk-producing qualities to the Angora; as, with this quality, and the value of its fleece, the Angora would wholly replace the common goat.

Mr. F. S. Fulmer, of Spring Mills, Appomattox County, Virginia, writes us:—

"My Angora goats, fifty in number, pure bred, got their living all last summer in a pasture where grass (other than broom straw) and clover never grows. So far this winter I have fed them nothing but coarse corn-stalks. In fact, up to this time, they have kept in a thriving condition almost entirely on acorns, of which they seem very fond. I treat them as to shelter, &c., just as I would sheep, except I am rather more careful to keep them out of cold rains [an important observation]. From my experience, I am led to conclude that the Angora goat, aside from first cost, can be made to pay better than sheep, especially in the Southern States, where they can have large ranges over poor land."

The culture of this animal is now receiving much attention in the Australian colonies. Mr. Samuel Wilson, who is said

to have had exceptional opportunities for observation, in a paper read before the Victorian Zoölogical Society, says:—

“Some think the preferable plan of starting a flock of Angoras is to commence with a few *pure* goats, and trust solely to their increase. By this process, considerable time must elapse before a large number could be raised; while, by commencing with the common goats, you can obtain, by crossing, in six years, a valuable flock, only limited by the number of common goats procured at the commencement of the operations. It is urged, as an objection to this system, that you can never reach absolute purity. Theoretically, this is self-evident; but, practically, you can eliminate every trace of base blood. By constant use of pure sexes, and by judicious selection, a standard would be reached, at least as pure and as certain to breed pure to type as that of the improved Leicester sheep, the modern fox-hound, or what we call the ‘thoroughbred’ horse.”

The writer of this paper has, for a long time, made a special study of the Angora goat. In 1869, he prepared an elaborate essay on the subject, which was published in the Proceedings of the Boston Society of Natural History, and subsequently was translated and published in the Transactions of the Royal Agricultural Society of France. In that essay, he held the view that the characteristic qualities of the fleece could not be secured by breeding the Angora on the common goat. This opinion he has been compelled to modify. While believing, with Mr. Peters and Mr. Wilson, that a pure-blooded sire should be always used, he must admit that good fleece-producing animals may be founded on the common goat. The conclusive fact establishing this is the statement of the Messrs. Bowes, in their statistics of wool for 1878,—a very high authority. They say:—

“We may refer to the acclimatization, in the Cape of Good Hope, of the Angora goat, on which mohair is grown. The progress made during the last dozen years has been very satisfactory, not only as regards the quantity produced, but the quality, which has been very much improved. The first shipment made was in 1865, and consisted of 6,804 pounds; in 1869, 245,000 pounds were shipped; and, in 1876, the quantity reached 1,298,455 pounds.”

This great quantity could not have been grown upon pure animals, as they could not have been procured. It must have been the product of graded animals. The best test of the value of this product is that it has become a regular commercial article. These facts, and the experience of the Southern gentlemen whom we have quoted, place it beyond doubt that the culture of the Angora goat can be made a most remunerative industry at the South.

TEXAS.

The sheep husbandry of this State is so distinct in its character from that pursued or feasible in the older States of the South, and is of such high importance, that it demands a separate consideration. The estimated number of sheep in this State, in January, 1878, was 3,674,700. It ranks at present as the third wool-producing State in the Union, although having but about a hundred thousand head less than Ohio, which has 3,783,000, and about half the number of California, which has 6,561,000 head.

In its adaptation for sheep husbandry on a large scale, Texas possesses decided advantages over our other Southern States, enormous ones over the Northern and Eastern States, and many over California and the trans-Missouri regions. The cheapness of land ; its natural fertility ; its genial climate and exemption from tempestuous weather, except in the northers, whose severity is generally much exaggerated ; the absence of seasons of continuous drouth, owing to the influence of the gulf before referred to ; the possession of permanent winter grasses, making the pasturage perennial,—are advantages which will make Texas one of the great wool-producing countries of the world. Dr. Randall said, in 1859, of regions of Texas which he had thoroughly studied :—

“I do not entertain a particle of doubt that wool can be raised more cheaply in those regions than in any other portion of the globe where good government prevails, to make life tolerable and secure, and such property as sheep safe from frequent and extensive depredations. In no such portion are lands furnishing perennial pasturage, or the use of

such lands, so cheap. In none are general circumstances more favorable, the accidental and occasional disadvantages so few."

Upon its annexation to the United States, in 1845, Texas retained, as the most valuable, though then little appreciated, relic of the former Mexican proprietors, scattered here and there, flocks of the so-called "native" sheep of Mexico, of which large flocks still abound in that country, and which still furnishes an easy supply of all that are needed. This race, greatly deteriorated by neglect, small in size, and bearing about two pounds of coarse wool, is supposed by many to be degenerated merinos. It is now well established that they are descendants from the *Chourro* race of Spain, even at present distributed in all parts of that kingdom, — a race distinguished for its robust temperament, the facility with which it is nourished, and its resistance to hunger and tempestuous seasons. When the animals are properly fed and bred, they may be made to produce a long and very white, though coarse, wool, well adapted for carpets. This is the stock which was the original foundation of the present Texas flocks.

The first recognized improver of these sheep, and therefore the founder of the present sheep husbandry of Texas, was G. W. Kendall, who had been an editor of a leading paper in New Orleans. He was the first to conceive the idea of engrafting the merino stock upon the native Mexican sheep. His experiments were attended with extraordinary success. He was, in his time, the largest wool-grower in the State. "Braunfels" (his establishment), about twenty miles northeast from San Antonio, will take its place in the history of sheep husbandry with "Camden," the initial point from which the sheep husbandry of Australia spread. Mr. Kendall did for Texas what Captain McArthur did for Australia. They were the great benefactors of their respective countries. The journalism of America can cite no better example of the influence of that great profession than the results achieved by the journalist, Kendall.

We regret that, with all our efforts, we have been unable to obtain condensed, original statements in regard to the sheep

husbandry of Texas, like those so kindly furnished us by Mr. Peters and Colonel Watts in relation to Georgia and South Carolina. In their absence, we must content ourselves mainly with giving extracts from the Texas correspondents with the Department of Agriculture. Although fragmentary in their character, they will, perhaps, present a more exact picture of the general sheep husbandry of the State than could be given by more elaborate and better-arranged statements.

We give the extracts at hazard, and without reference to the geographical position of the counties, or their bearing upon any particular question in sheep husbandry. In order to preserve the piquancy of the statements, the exact language of the correspondents is given in all cases. The correspondents, it will be remembered, are selected by the Department from the most intelligent agriculturists residing in the several counties.

A correspondent from Palo Pinto County writes:—

“A sheep-raiser for several years says: Say for 1,000 head, it will cost \$300 for herding; extra help in lambing time, \$30; salt, \$15; cost of shearing, \$50; feed during winter, \$200. We imagine the Georgia Bureau of Agriculture knows but little about large herds of sheep, as they are grown on prairie grass. They are accustomed to herds of from 10 to 100 head. Such flocks are not necessary to be herded, and yield a fine profit. If we make it a specialty, and put 500 to 1,000 in a herd, which is common here, they will not pay so well. The figures, made on paper, will show them to pay better than any thing else. But a very little experience shows the figures quite an error. Small herds here will pay very well, and much better than large, when they are so large as to require a herder.”

Navarro County.—“I have been engaged,” says the correspondent, “in sheep-raising for fourteen years. In this and all the old, settled prairie counties, 300 to 400 sheep do well. 100 per cent gross profit is a fair statement. The profit diminishes 10 per cent per 100 head, as you go over 100. My flock has ranged from 300 to 1,000. I put up annually 100 pounds of prairie hay and one bushel of cotton seed to the sheep, and have good shelter provided.”

Goliad County.—This correspondent, Hon. Prior Lea, the writer has the pleasure of knowing personally to be entitled to great confidence. “Cost and profit of growing wool may be estimated in two

ways. Crediting increase of sheep as equal to all cost, the wool would be net profit; and this, at least, is claimed by many persons. Without crediting increase for more than enough to maintain the flock equal to its primitive condition, a practical estimate for cost, considering every kind of item, might be from 10 to 12 cents per pound of unwashed wool, averaging 17 cents in market. This latter mode gives broad margin for contingencies."

Brandon County. — "Cost of keeping sheep, about 25 cents per head; profit, 30 cents to \$1.00, exclusive of increase."

Another; same county. — "One flock of 800 cost, for shepherd and salt, \$275; net profit, including wool and increase, 31 per cent."

Aransas County. — "Cost of keep, 10 per cent; profit, 50 to 60 per cent on capital. Mr. P.'s flock average 50 per cent of its total value as profit. About 100,000 sheep in the county, mostly improved merinos."

Beurre County. — "One-half in farms under cultivation; all the rest a complete pasture. Sheep-raisers say this is the best county they ever saw."

Callahan County. — "Flock of 2,000. 20 cents per head cost. Profit by wool, 40 cents per head."

Fort Bend County. — "250,000 sheep could be raised in this county. One-quarter in cultivation. All the rest adapted for sheep-pasture, yet no sheep worth mentioning: all cattle and cotton. At close of war, sheep-raising began to decline, owing to depreciation of price of wool. A reaction has now taken place: extensive pastures are now being enclosed; improved breeds are introduced."

Kendall County. — "Mr. B. has 1,000 head of sheep. Shears, 5,000 pounds of wool; at 28 cents, \$1,400; cost of keep, \$325: profit, \$1,075."

Another; same county. — "A successful sheep-raiser says: 'I commenced with 220 ewes, three years ago; and have sold sufficient of the flock to make an increase of 100 per cent. per year, average; and the wool has averaged for that time from 75 cents to \$1, annually.'"

Lavaca County. — "Mr. S. B. M. has a flock of 1,500 head, let out to a herder on shares; and, therefore, furnishes a pretty fair sample as to profits. He gives the herder one-quarter of the wool and one-quarter of the annual increase, that is, the actual increase. He furnishes the salt, sheep dip, &c. The herder pays all other expenses, except shearing; and pays one-quarter of this amount. This makes the yield to the owner, —

For wool	\$800.00
The increase of the flock will average 800 head; which, at \$1.50 per lamb, in spring, makes lambs.	\$1,200.00
Deduct from this \$1,200, one-quarter to herder	300.00
which leaves	<u>900.00</u>
Leaving a balance as net profit, on one flock, of	\$1,700.00
or about \$1.13 per head on the entire flock."	

Nueces County.—There are several reports from this, the leading wool-producing county in the State.

One correspondent says: "Sheep husbandry is the leading industry; and a higher degree of intelligence is devoted to it than to any other enterprise in the county."

Another says: "I would estimate the cost of keep and profits on the sheep (Spanish merino) as follows:—

1 two-year-old ewe cost \$5.00.

Dr.			Cr.
To interest, one year at 12% . . . . .	.60	By 5½ lbs. wool at 20 cts.	\$1.10
„ cost of feed, herding, salt, &c.	1.00	„ 75% of lamb at \$4.00	3.00
„ Buck service . . . . .	.40		
„ Insurance . . . . .	.10	Total	\$4.10
„ Shrinkage in value . . . . .	.70	Less cost of keep	2.80
Total	<u>\$2.80</u>		<u>\$1.30</u>

Per cent of profit, 25.

"My own flock, now numbering 1,700, started 460 in 1873 (merinos and Cotswold grade), has paid above per cent. of profit, or more."

Another careful correspondent from the county of Nueces says: "Rams have been imported in large numbers. Improvement is already far advanced. Flocks are sheltered from Nov. 15 to Feb. 1, by selecting their range and night-camp on the south side of some creek or prairie-timber. There is no foot-rot. Semi-annual lambing is generally adopted in this county; the February or spring crop being always the most preferable. One set of ewes lamb in the spring, and another set in the fall. Those who shear the best and most desirable clips of wool handle their sheep in moderately large flocks of 1,000 to 1,200 head. Provision is only made for select sheep, — such as rams. Average weight of fleece, 5 pounds. Average cost of keeping, 25 to 28 cents. Profit, 72 to 75 cents. Where dipping has to be added, the general expenses will be 3 to 4 cents per head. Good tobacco, liberally used, invariably cures the scab; all other preparations have

failed in this county. Profits on wool only given as profits from increase are rarely turned into cash. Ewe lambs of high grade sell readily for \$2.50 to \$4 per head. The cost of keeping, where the shepherd cares for only 1,000 sheep, is the cost given; where he cares for 1,500 to 2,000, as many do the year round, the real cost is proportionably less."

The number of sheep in this county, according to the returns of assessors, is 656,000; and the remarkable fact is presented to us, that very nearly the most southerly country of the whole United States is the banner sheep county of the Union. The adjoining county, Starr, has 184,000 sheep. And these two counties have more sheep than the four States of the South — Georgia, South Carolina, Florida, and Louisiana, together; or the conjoined States of the North, — New Hampshire, Vermont, Massachusetts, and Rhode Island.

One of our own correspondents, certified to as one of the oldest and best citizens of Texas, writes us as follows: —

WACO, McLELLAN CO., TEXAS, Jan. 12, 1878.

SIR, — I have been directly or indirectly interested in wool-growing, in this State and section, for many years. The country is rolling-prairie land; the soil, black, waxy, and, in sections, quite sandy, and an excellent grazing country. The natural grasses are the sedge and mosquito; of the latter, three varieties, — the best, the bearded variety. My flocks have been French and Spanish merinos, mixed; the average product of fleece being six pounds, at an average valuation, for five years, of 25 cents per pound. This can be produced under favorable circumstances for 16 cents net cost to the shepherd; but he should have not less than the ten cents profit added, to make a paying investment. If there is no change in our duties, I am confident that there is no more promising industry in the country than wool-growing; but, if we are to have reduced duties, or free wools, the occupation will have to be abandoned.

There is no objection to sheep from any section of the North or West, if free from disease. For the ordinary wools, I would prefer the merino; for mutton or combing wools, a cross of the Cotswold with pure-blood merinos. The country is uniformly healthy for sheep here. In three months of the winter, the sheep should have some feed: say

one-third of their consumption. I would say that sixty-five cents a head would cover every possible contingency or cost in sheep husbandry, per annum, in this section. As I have said, if the farmers are to keep the protection they now have against the producers of foreign wools, there is no more profitable industry that any one who will put his attention to the business can be engaged in.

Yours truly,

W. R. KELLUM.

Another of our own correspondents writes as follows : —

HOUSTON, TEXAS, Jan. 9, 1878.

DEAR SIR, — I have had long experience in sheep husbandry in the San Joaquin and Santa Barbara country, and also in Los Angeles, California. I know well Colonel Hollister, Mr. Dibbles, of California, and other prominent wool-growers there. I was also for a time in Utah ; also, in Western Texas, — which I regard as the best country for the industry with which I am acquainted, if life and property were only secure against Mexican depredations. The climate, for man and beast, is unrivalled ; the feed, rich and unfailing all the year round. No country I know of could so well sustain the large flocks which, from various causes, are being broken up in California.

In a parallel drawn north from Laredo to the Indian Territory, there is the best location for the industry, in my judgment, in the country. But, until Uncle Sam will protect us there, the life of the shepherd and his flocks are in constant jeopardy from the Mexicans. These thieves and marauders operate in a regularly systematic way ; being fitted out and encouraged by the wealthy Mexicans living on or near the border, who for years have been at the bottom of all the border troubles, from their desire for annexation to this country. Their purpose constantly is to provoke a war ; believing the result will be annexation, when they will then have a stable government, which they know they never will have under any Mexican leader. . . .

There are other very fine fields for this industry near Corpus Christi, San Antonio, north and south of Dallas ; but the finest section in this country, in my judgment, must remain idle, unless, as I have said, the government will give protection.

S. W. PIPKIN.

Statements of Mr. Shaeffer. — After the above notes had been put in press, the writer enjoyed the privilege of several personal interviews at Washington with Mr. F. W. Shaeffer,

of San Diego, Texas, commended by members of the delegation in Congress from Texas as the highest authority on sheep-growing in that State. The following notes, which this gentleman permitted us to take at these interviews, will serve to give a much more exact idea of the present condition and resources for sheep husbandry in Texas than the notes before given.

Our informant, born in Ohio, was early in life engaged in mercantile pursuits in the city of New York. Finding them uncongenial, he embarked in sheep husbandry in Texas, about the year 1857; settling in the higher region of the State, north of San Antonio. The foundation of his flocks, which now number 15,000 head, was sheep purchased before the war from a brother of General Beauregard, supplemented since the war by 1,500 breeding ewes, obtained from the estates of G. W. Kendall, identified with the introduction of improved sheep husbandry into Texas. Finding the climate in the high region where he was first established not as mild as he desired, he purchased lands in the more southerly region of the State, about fifty miles from Corpus Christi, in Nuéces County, obtaining gradually about 80,000 acres; the whole of this great tract being enclosed in one vast pasture by a wire fence, which cost upwards of \$16,000. Here he found the climate so mild that the sheep thrive absolutely without shelter. He regards it as necessary only to keep the sheep fat and in good condition, to enable them to resist without inconvenience the cold wind and rain of that climate. Even the shepherds have no shelter, except such as they may make with their blankets; and no means of warming themselves, but a fire on the open ground. They suffer no inconvenience, however, from this exposure, and are always on hand to take care of their sheep.

The sheep in this district are divided into single flocks of from 1,100 to 1,300 in number; usually about 1,100, this being about the number which can be advantageously kept together under the care of one shepherd. The ewes, with their lambs, are kept separate from the dry ewes, and the wethers, — or *muttons*, as they are generally called. A thousand or eleven

hundred sheep will "herd" or keep nearly together * within a space which the shepherd can easily move around. When driven out on the range from the camping-ground, they are kept constantly moving for a mile or two; the shepherd continually moving around the flock, which is guided by his voice. They snatch their bites of grass as they go slowly along. They return in the same way, slowly feeding, to the camping-ground, generally selected on the southerly side of some creek, or under the shelter of the prairie-timber. In rainy or cold weather, the sheep travel much more briskly than in warm. In very hot, dry weather, they often will not feed by day, making up for it by feeding late in the night. Thorough-bred shepherd dogs have been hired; but have been found useless, except to relieve lazy shepherds, who can do the necessary guiding much better than the dog. The flocks, however, are usually attended by cur dogs, which are useful for frightening away wild animals. These curs, having been suckled when young upon goats, continue to attach themselves to the flock. The shepherd dogs were discarded, because it was found that, when they drove the sheep, they caused them to huddle together, thus making a great loss of feeding time. It is of the first importance to keep the animal fat. Its fat condition not only makes the fibre strong, but enables the sheep to resist the storms and cold. If sheep are fat, they are also better able to endure occasional drouths. All the sustenance in the country in question is supplied by the natural pasturage, which consists of different varieties of the *mesquite* grass. A great superiority of these grasses over the annual grasses of California consists in their being

* Mr. Shaeffer gives a satisfactory reason for the fact, often stated without explanation, that the English races of sheep, the Cotswolds, Leicesters, &c., cannot be kept in large flocks. The reason he gives is, that the Cotswolds will not "herd" or keep together, like the merinos. While feeding, they invariably scatter over a wide domain. A Cotswold, if tired, will lie down, and cannot be driven up by the shepherd; and, when it recovers, is liable to wander off and join another flock. Mr. Shaeffer thinks that the Cotswold blood should never be introduced into large flocks of merino sheep. Without greater care in breeding than the ordinary flock-master can exercise, they will make the wool of the flocks uneven, and ultimately ruin them.

perennial, and having long and stout roots, which cannot be pulled up by the sheep, nor trodden down. Although the grass may be apparently dry during a drouth, after a rain it becomes perfectly green in a week or ten days. The rams, it may be observed, except when they range with the ewes, are confined in enclosed pastures. They receive in winter extra forage; either cotton-seed (which is considered more nourishing than grain), or, more generally, oats. A new variety of oats has recently been grown in Texas, called the "Antirust." This variety has been known to produce as high as 100 bushels to the acre, weighing 37 pounds to the bushel, instead of 32. Through its introduction, the price of oats has been reduced from about seventy or seventy-five cents to twenty-two cents. It is sown in November, and fed off during the winter, which increases the crop of grain. This variety would be admirably adapted to the Georgia pine lands for a winter forage for sheep.

Although the original stock upon which Mr. Shaeffer's flocks were engrafted was principally the native Mexican sheep, improved by merino bucks, the Mexican blood has been so completely eradicated as to show no trace of its existence. The native Mexicans would weigh scarcely more than from fifty to fifty-five pounds, gross weight, and produce fleeces of poor wool, weighing about four pounds. The improved sheep of Mr. Shaeffer average for the whole flock seven pounds of unwashed fine wool. His wethers—or "muttons," to adopt the Texan term—will weigh, at four years old, one hundred pounds gross weight.

These sheep, which are of the best improved American merino stock, make excellent mutton. The mutton fed upon the mesquite grass never has any of the rankness or *muttony* flavor peculiar to those sheep at the North. A great number are now sent from Nueces and other counties in Texas to St. Louis and Chicago, where they bring good prices. They reach these markets before the Western sheep are sheared and ready for the butcher; and they form an important source of supply for these markets in the spring, coming in like the Southern vegetables to our Northern markets. A notice has

recently been published of the loading of ten double-decked cars, carrying 160 animals each, with sheep, at San Antonio, destined for the Chicago market, at a distance of 1,500 miles. One flock of three-year-old wethers was sold by Mr. Shaeffer for \$3 a head, to a party who pastured them for two years, in Texas, receiving their wool for this period; and who sent them to market in New Orleans, at five years old, where their fatness and the excellence of their meat was the subject of general comment. Mr. Webster used often to say, at his dinner-table, that he never knew the secret of making good mutton until he visited England, where he found that it was *age*, the best mutton being five years old. While the sheep increase but little in weight after the third year, the meat constantly improves in quality. It may be readily seen how easy it is to obtain good mutton where the food costs absolutely nothing, and almost the only cost of keeping the sheep till full maturity is the interest of the capital, while the sheep are all the time producing their semi-annual returns of wool.

The flocks in this country are kept up by the constant purchase of regenerators. These are the rams raised in New York, Vermont, and Ohio, by skilled breeders, who find this much more profitable than growing large numbers of sheep for wool or mutton. A very large number of Northern rams are sold in Texas. Mr. Shaeffer has himself purchased over 800 at the North, many of them from Dr. Randall. There are at present five hundred rams in Corpus Christi; all which will be sold at prices ranging from \$30 to \$50, and very choice animals for \$100. The Texas sheep husbandry is thus the means of keeping up the most profitable branch of sheep culture at the North, — a branch which may be carried on upon the highest-priced lands. The high-priced rams are kept in Texas two or three years, and sold at a less price to persons commencing the sheep business with but little capital.

It had been the custom for the Texan flock-masters to sell the high-bred rams produced from their own flocks, only at the high prices demanded by the Northern breeders. Mr. Shaeffer early saw that he could benefit his country better, and do as well for himself, by changing this system. He found

that the young men of his country going into the sheep business could not pay these high prices, and make a living. He therefore reduced the prices of the high-bred rams which he had raised in Texas, to from five to ten dollars, and sold a great many more by so doing. This had the effect of greatly extending the improvement of the flocks in the country. Another step taken by him was important for the development of the country in the direction of sheep-growing. Mr. Shaeffer found that contests were constantly occurring between the cattle-herders and the shepherds. He, therefore, began gradually to purchase all the lands he required: his example was followed by others; and, at present, the greater part of the land in the sheep-region is held in freehold by the respective flock-masters.

There has now been so long and extensive an experience in this country as to reduce the methods of the peculiar pastoral sheep-husbandry to a well-established system, which is so simple that it may be easily learned by any intelligent person. The plant required for the business, except the first stock of ewes and rams, is exceedingly small. No buildings are required, if we except the covered platform for shearing. A rude camp is all that is necessary for the flock-master, and a wagon with a pair of horses for his supplies,—of course, he will have a saddle horse. The well-arranged *ranche* is an after luxury, to be earned by the profits of the enterprise. The aim is to have flocks of at least 1,000 or 1,100 head, for each of which one shepherd,—invariably a native Mexican, called a *pastore*—is required. It is desirable that the proprietor should have at least three flocks of this number. The separate flocks, each with its shepherd, are so located that they can be brought at night to a central camp, where the *baccierro*, or sheep-overseer, also a native Mexican, is established. This overseer is necessary, in all cases, to relieve the shepherds in case of accident, and to cook their rations. The *baccierros*, as a class, are remarkable for their fidelity. The *impedimenta* of the camp, if they may be called by this name, consist only of the rudest cooking utensils and the stores of provisions; no shelter being required, and the bed of the

shepherd being a sheep-skin. The food or rations of the shepherd are corn for *tortillas*, or, sometimes, flour, coffee, and fresh meat, no pork or bacon being used. The fresh meat is almost invariably supplied by goats, which are pastured with the sheep, for this purpose. They cost about a dollar a head. Their flesh is excellent, and preferred by the Mexicans to any other. The quantity of goats' meat which the *pastore* will consume is enormous; the consumption being about one goat a week to the shepherd.

The shearing seasons are the busiest times for the Texan flock-master, not only on account of the number of extra hands to be overlooked, but because upon the care exercised at these periods, in culling, depends the future character of the flocks; and the tying up of the wool nicely is important for its sale. The shearings take place twice a year. The spring shearing commences about April 15th, and the fall shearing about Sept. 15th. The shearings continue from three to four weeks, according to the weather. The practice of two shearings a year has been adopted, from the experience that it is most advantageous for the warm climate of Texas. It has been a mooted question, whether there is more profit in shearing twice a year than once. By shearing twice, the wool, of course, is shorter; is fitted for only one purpose,—that of clothing; and brings a less price per pound. The high prices of wools for combing purposes, for which many of the improved wools of Texas, if suffered to grow to their full length, are well adapted, is lost; and there is the additional expense of the extra shearing. But, on the other hand, the sheep sheared twice a year are healthier, and keep fatter; and the shearing checks the scab, if there is any tendency to this disease. The flock-master gets the money for his wool twice a year, instead of once; an important consideration where the least rate of interest is one per cent a month. The double shearing is especially advantageous to the lambs. By giving them their first shearing in August, to be repeated in the next spring, their health and growth are greatly promoted, and, consequently, the general increase of the flock. Mr. Shaeffer believes it would be advantageous to shear the

lambs twice, even at the North. Seeing the lambs in the flock of an eminent breeder, in Missouri, failing, Mr. Shaeffer recommended immediate shearing. The advice was followed, and all were saved; one of these lambs (a ram), when grown, was afterwards sold for \$150.

The shearing in Texas is all performed by Mexicans, from both sides of the river Rio Grande; many coming in, for this purpose, even from as far as Monterey. They shear by the head; the usual price being \$3.50 per hundred for fine sheep. The shearers average about thirty head a day. The shearing is performed on a floor or platform, especially constructed for this purpose. The most careful flock-masters have this floor protected by a roof. The barn floors of the North, it must be remembered, are not known in Texas. In shearing, the Mexicans tie down the sheep upon the floor, usually about ten at a time. This time the flock-master improves for examining his sheep and the character of their fleeces. He selects those which are to be culled out on account of age or defects of fleece, or those which are to be preserved for special uses in breeding; makes the proper marks upon the animals, duly entering them into his sheep-book. The wool from the spring shearing is tied up in fleeces; the fall shearing, being light, is put in sacks, without being tied. The packing the wool in sacks, although it cannot be dispensed with, is considered disadvantageous to the grower of the wools; as wool from inferior fleeces, or an inferior part of the body, is liable to be mixed with better wool, and to prejudice the whole lot to the buyer. It is believed that a profitable enterprise, and one very advantageous to the Texan growers, would be the establishment in that country of extensive wool-scouring establishments, like those in Belgium and France. The facility of obtaining scoured wool would be advantageous to manufacturers with small capital and establishments, and in saving of freight. The sheep in Texas, it must be observed, are never washed. The water is calcareous; and perhaps contains iron, because it makes the wool black.

Even with the rich pastures of Texas, it is deemed desirable to have at least two acres to every sheep. It is of the

first importance that the range should not be overstocked. A much larger range is required than in regular, enclosed pastures, over which the sheep scatter as soon as they are driven to them; while in the open range, under the care of the herder, much of the grass is trodden down by the sheep passing from one point to another in compact flocks, from their sleeping grounds. The proportion of bucks required for the ewes is larger than in the North, as the bucks run with the ewes on the range about five weeks. Three bucks are required for every hundred ewes. The main lambing takes place from Feb. 20 to April 1. It is an interesting observation in regard to lambing, that it is attended with much less danger and difficulty where the sheep live in the natural state of wild animals, than under a more artificial system. This applies, also, to the general health of the animals. During the lambing season, in the evening or next morning, after the flock of ewes, with the lambs dropped during the day, — say from fifty to one hundred, — are driven into the camping-ground, the ewes with the newly dropped lambs are separated from the flock, and suffered to rest until the middle of the day, near the camping-ground. The next day, they are moved to another camp-ground, to give place to those which come on that day; the last comers to join those which came on the previous day. This continues until a flock of about 500 ewes and 500 lambs is made up, which is kept separate. It is not safe to calculate, one year with another, that the number of lambs raised will be more than eighty per cent of the ewes.

All the ewes which lose their lambs for any cause are turned in with bucks, by the first of June, to lamb in November.

Our informant has but little faith in estimates of profits, as the circumstances vary so much in the situation of the establishment, and the personal and economical habits of the flock-master. He has consented, however, to make a statement of the necessary expenses and results, with one flock of 1,100 sheep, in one year.

EXPENSES.

Shepherds and wages at \$11 per month and rations	\$250.00
Shearing and sundry expenses at shearing-time	77.00
Dipping for scab, four cents per head	44.00
Sheep dip for worms	5.00
Extra labor	20.00
	<hr/>
	\$396.00

Salt is not required near the coast or with mesquite grass.

RECEIPTS.

1,100 sheep, at 5 lbs. per head, equals 5,500 lbs. wool;		
at 20 cents per pound . . . . .	.20	
	<hr/>	
Cash receipts	\$1,100.00	\$1,100.00
80 per cent increase, 880 head at \$3.00.		2,640.00
		<hr/>
		\$3,740.00
Less expenses	\$396.00	
Interest on \$5,000 at 12 per cent	600.00	
Rent of place	100.00	
	<hr/>	
	\$1,096.00	1,096.00
		<hr/>
		\$2,644.00

In this statement, the expenses of the overseer are not included. One is required, in all cases; but one will suffice for three or four flocks. It is best to start with 1,600 head of ewes; because after lambing they can be divided into three flocks of ewes with their lambs, with an expense of but one *baccierro* and one camp, and three shepherds. At the end of five months, the lambs are weaned and taken from their mothers. Then, until the next lambing time, which will take place in the succeeding March, the sheep can be well cared for by only two shepherds and one overseer; the ewes being in one flock, and the lambs in another.

The procedure and increase may be illustrated as follows:—

We will suppose the new flock-master commences	
October, 1876, with ewes	1,600
March, 1877, the ewes produce 80 per cent of lambs.	1,280
September, 1877, weans the lambs; places them in one flock, and the ewes in another, making only two flocks.	

March, 1878, there are ewes	1,600
" " " yearlings; one-half ewes, and the other half wethers	1,280
" " " lambs as 1877	1,280
Making four flocks; three of ewes and lambs, and one of yearlings . .	4,160
October, 1878, there are breeding ewes	1,600
" " " young ewes	640
Total to go to ram in October	2,240
March, 1879, there are wethers, two-years old	640
" " " yearlings (ewes and wethers)	1,280
" " " breeding ewes	2,240
" " " lambs	2,240
	6,400
October, 1879, there are breeding ewes	2,240
" " " yearling ewes	640
Making number of ewes to go to ram	2,880
March, 1880, there are breeding ewes	2,880
" " " lambs	2,880
" " " wethers three years old	640
" " " " two " 	640
" " " yearlings, ewes, and wethers	2,240
Total number March, 1880	9,280

Advice to Emigrants.—The adventurer from a distance, seeking to invest in sheep husbandry in Texas, is advised to proceed directly either to Corpus Christi or San Antonio, from each of which points he can make observations with convenience, and obtain information as to desirable locations. He should spend three or four months looking around for a range. The ewes may be carried from the West, or bought in Texas. Mexican ewes can be purchased at 75 cents per head, and improved sheep for from \$1.50 to \$4. Texas raised rams can be bought for \$10, and imported rams for from \$30 to \$50. It would be more safe to rent a tract of land, which he can probably obtain at a very cheap rate,—say \$100 per year for enough land to feed two flocks of sheep of 1,100 each. As he may not like the business or the locality, it would be more prudent, at first, not to purchase a range. If he is willing to incur greater risks, to secure the

propriatorship of an extensive range at a moderate price he may go higher into the country, where the land belongs to the State. A 640-acre certificate of State land can be bought for about \$200, or a certificate of the alternate lands granted to railroads as low as \$100. Generally, the expense to secure a patent, including certificate and cost of surveying, would amount to about 50 cents to the acre. As two acres are required for a sheep, it will be seen, from the statement of increase before given, that the command of a very broad range is required to make the increase available; and that, with such a command, there are chances for very large profits. The adventurer, if he has a family, must place them in some of the towns or villages most convenient to his range. His personal presence on his range will be indispensable for his success, and he will find ample occupation. But he can safely trust the Mexican *baccierros*, when making occasional visits to his family.

The advantages of Texas for sheep-growing are now attracting persons of experience in Australia, and English and Scotch emigrants with capital. Besides our informant with his 15,000 sheep, there are others in Nueces and Duval Counties with flocks of ten to twenty thousand head. The Callahan flock, in Star County,—the proprietor living at Laredo,—numbers sixty thousand head. When we see how rapid the increase is, and that there are 80,000,000 acres of land still unlocated in Texas, we can see that, if there is no legislation to disturb the wool business of the country, and the Mexican and the Indian depredations are checked, it will not be many years before Texas will rival Australia. Mr. Shaeffer states, as an illustration of the rapidity with which sheep husbandry is advancing in this State, that, in 1876, San Antonio received but 600,000 pounds of wool, which is sent through Galveston. In 1877, she received 2,000,000 pounds. The wool of Nueces and the neighboring counties is shipped from Corpus Christi. In 1866, there were shipped only 600,000 pounds. This year there will be shipped 6,500,000 pounds.

The following statement, illustrative of the profits which may be derived from sheep-growing in Texas, was made to us by Colonel John S. Ford, a State Senator, and formerly a

member of the Congress of Texas, before annexation. We give it exactly in the language of Colonel Ford, as noted by us and subsequently read to him.

“Dr. Thomas Kearney, formerly Collector of Customs of the port of Corpus Christi, and Major James Carr, made, in 1870 or 1872, an investment of \$5,000 in sheep husbandry; bought ranch, and buildings about sixty miles north-west from Laredo, Webb County, Texas, — the land about 13,000 acres and the sheep well improved. At the end of five years, Dr. Kearney sold out his interest to Carr, — that is, one-half interest for \$20,000. In August, 1877, Carr refused a \$60,000 offer, which he had from William Votaus, for his sheep ranch with the sheep; the exact facts being that Votaus offered \$30,000 in cash, and one of the best-improved places on the San Antonio River, which had cost him about \$60,000.”

Mr. Shaeffer says that Carr ought to have taken the offer.

Colonel Ford fully confirms the statements about the Mexican and Indian depredations, before made, which extend as far as a hundred miles from the Rio Grande. There is no necessity for this confirmation, however, to any one who will read the exhaustive reports, prepared by Mr. Schleicher, of the Texas delegation in Congress. Colonel Ford says that the Mexicans do not run the sheep off, because the sheep cannot be made to travel fast enough; but they kill the shepherds.

Obstacles to Sheep-growing in Texas.—Conversations with many intelligent Texans, and the perusal of many documents relative to Mexican outrages, have led us to fully adopt the opinion expressed by one of our correspondents, that the most formidable obstacle to the almost indefinite extension of sheep husbandry in Texas is the liability of the territory to Mexican and Indian depredations. The opinion widely prevails at the North that the border troubles in Texas have been exaggerated for the purpose of provoking a war with Mexico. In our belief, there is no foundation for this opinion. The extent of the depredations, and their ruinous effect upon settlements, are proved by incontestable evidence. A peaceful and comparatively inexpensive remedy for the border troubles is strongly urged by influential citizens of Texas. It is the granting a moderate subsidy (six thousand dollars per mile) to a railroad

projected from Galveston to Camargo, in Mexico, near the Rio Grande,—a distance of 352 miles.* It is reasonably urged that this road to Camargo—the key to the commerce of Mexico, by a land route—would establish friendly commercial relations with Mexico, and heal the irritation which keeps up the border troubles, and thus prevent war; while, in case of war, it would furnish the means of quickly transporting troops and supplies to the most important point of defence. If the proposed road will accomplish this, it will directly promote the interests of the cotton and wool manufacturers of the North.† To Texas, more than any other State, do the textile manufacturers of the North look for the supply of their mills. No other State is making such rapid progress in population, production, and wealth. With an area which exceeds that of the German Empire by about sixty thousand miles; with a capacity to produce almost all the products of the temperate zone; with sugar lands on the Southern border which could yield double the quantity of sugar and molasses required for our whole consumption,—Texas is above all pre-eminent for its resources in textile material. On less than one-half of one per cent of its area, it produced, in 1875, one-half of all the cotton consumed in the United States; and four per cent of its area would be capable of producing all the cotton now consumed in Europe and the United States,—over six million bales.‡ Add to this its capacity for wool pro-

* “No such thorough and satisfactory mode of settling Indian troubles has been discovered as the construction of a railroad through the Indian country. The war-whoop of the savage is never heard within sound of the locomotive whistle. The civilization that is represented by the church, the school-house, and the farm, the Indian regards as his legitimate prey; but, when it comes clothed with the thunder of the advancing railroad-train, he retires from the contest.” — *Speech of Hon. William Windon, of Minnesota, in the U. S. Senate, on the Northern Pacific Railroad.*

† We refer to this scheme as only one of the means of peacefully solving the border troubles. A still broader scheme in the same direction, but with even a more modest demand for government patronage, is the proposal for a government survey of a railroad route from Austin, Texas, to the Rio Grande, and from thence to the Port of Topolovocampo, on the Pacific; the distance from San Antonio to the western ocean being less than seven hundred miles. A railroad in this direction would be a peaceful solution of the Mexican question.

‡ Report of Mr. Edward Atkinson on cotton, at the International Exhibition.

duction, and we have a State without parallel in the extent of its natural resources. Such a State should not be grudged the trivial sum required to establish peace upon its borders.

We are compelled to omit much, in this paper, which is demanded to give a full description of the sheep husbandry of the South. But neither our object nor our space would permit us to make this paper a *gazetteer* of the South in its sheep resources and production. We have made no reference to Western Virginia, with its splendid sheep husbandry,—including the Panhandle, where the best fine wool in the United States is grown; because this country, from its contiguity, really belongs to the Ohio and Western Pennsylvania wool-producing region. Neither have we made reference to the mutton and combing-wool production of Virginia, Maryland, and Delaware, although it is a very important feature of the husbandry of these States; because there is nothing characteristic and peculiar to distinguish it from the industry of New Jersey. Missouri, as a wool-producing State, belongs rather to the West than the South. We ought not, however, to omit an enumeration of the sheep in the States south of Mason and Dixon's line. On the first of January, their numbers were as follows, according to the Department of Agriculture:—

NUMBER OF SHEEP IN SOUTHERN STATES, JANUARY, 1878.

STATES.	Number of sheep.
Delaware	35,000
Maryland	151,200
Virginia	422,000
North Carolina	490,000
South Carolina	175,000
Georgia	382,300
Florida	56,500
Alabama	270,000
Mississippi	250,000
Louisiana	125,000
Texas	3,674,700
Arkansas	285,000
Tennessee	850,000
West Virginia	549,900
Kentucky	900,000
Missouri	1,271,000
Total	9,887,600

NUMBER OF SHEEP IN THE NORTHERN AND WESTERN STATES,
JANUARY, 1878.

STATES.	Number of sheep.
Maine	525,800
New Hampshire	239,900
Vermont	461,400
Massachusetts	60,300
Rhode Island	24,500
Connecticut	92,500
New York	1,518,100
New Jersey	128,300
Pennsylvania	1,607,600
Ohio	3,783,000
Michigan	1,750,000
Indiana	1,092,700
Illinois	1,258,500
Wisconsin	1,323,700
Minnesota	300,000
Iowa	560,000
Kansas	156,000
Nebraska	62,400
California	6,561,000
Oregon	1,074,600
Nevada	72,000
Colorado	600,000
The Territories	2,600,000
Total	25,852,300

GENERAL CONSIDERATIONS.

Relation of Wool-production to Customs Duties.—This paper, intended for circulation at the South,—where theoretical opinions on questions of political economy, differing from our own, largely prevail,—is no place for the discussion of the vexed questions of free-trade and protection. But it would be a false delicacy on our part wholly to ignore the absolute dependence of the sheep husbandry of the United States upon a wise revenue legislation. The practical fact exists, that the revenue of the United States, for a long time to come, must be principally obtained from duties on foreign imports. All, independently of their theoretical opinions, will admit that these duties should be so imposed as to least injure the national industries. Many, who are not theoretical protectionists, will go even farther,

and admit that the encouragement of a national wool industry rises above all questions of economical theory, and that it comes within those exceptions to the theory of free-trade which even Chevalier, Mill, and Bright are compelled to concede, for the necessities of a nation's existence. Wool-growing, unlike the production of any other textile material, can be advantageously pursued in every State of our territory. No single industry can be mentioned so cosmopolitan in its character as that of the production and manipulation of wool, or to which national encouragement can be given with less risk of rousing sectional jealousies. The wool-industry is eminently national in its character, because it subserves the two great primal necessities of a people,—those of food and clothing. Sheep, by their manure, are capable of doubling the product of the wheat-lands on which they are raised. Their flesh is the most nourishing of all animal food. A sheep husbandry, made abundant by legislative encouragement of wool-production is the most effectual means of diminishing the cost of all animal food to our whole population, and thus may be truly said to reimburse manifold the alleged increased cost of clothing to our people caused by the protective duties on wool. The wool-industry is a necessity for the highest national development; because it promotes the highest arts of stock-breeding, is an indispensable adjunct to the most advanced form of agriculture,—a mixed husbandry, and its pastoral form is the pioneer to new settlements. In its manufacturing department, it more than any other industry promotes the highest mechanical, chemical, and decorative arts; and is the invariable precursor of a diversified manufacture, with its attendant results of wealth and culture.

These considerations are suggested, not as claims for high protective duties on wool or manufactures of wool, but as reasons for deliberation and wisdom in fixing the duties on those articles which are required for the national revenue. The most intelligent wool manufacturers admit the justice and propriety of reasonably protective duties on wool, the only means of affording national encouragement to the sheep-

industry of the country, — which we must have for food as well as clothing. It is doubtful if even Texas, with its wonderful pastoral advantages, could ever compete, without the aid of protective duties, with the Pampas of South America, in the production of wool. The cost of transporting wool is so slight — but two cents per pound even from Australia to New York — that distance is no protection ; and the Texan flock-master cannot procure labor for the wages of the Indian shepherds of the Pampas : while, like all other producers in this country, he is subject to the demands imposed by American civilization and our high local taxation. Even if the American flock-master could produce his wool as cheaply as the foreigner, he must be defended against the inpouring of foreign surpluses which, without defensive barriers, are liable at any moment to break down our markets.

Adjustment of Duties on Manufactures to Duties on Wool. — All the duties imposed for the protection of wool-growers, it need not be said, are paid by the wool manufacturers, who thus labor under a burden from which the cotton, linen, and silk manufacturers are free ; all the raw material for the two first being produced at home, and raw silk being free from duty. Notwithstanding the apparently high duty imposed upon fabrics of wool, it is a fact capable of demonstration, that, after deducting the duty which the wool manufacturers of this country pay upon the foreign wool which they consume, or the amount by which the domestic wool they consume is enhanced by the wool-duty, the wool manufacture of this country, under the existing laws, receives less protection than any branch of the textile industry. The fact that the wool manufacturer must pay the wool-duty makes it of the highest importance to him that the relations of the duties on the wool manufactures should be accurately adjusted to the duties on wool. The proper *relations* of these duties is to him of far more importance than the *amount* of the protective duty he may receive.

The American wool manufacturer has to compete with European manufacturers, who invariably have their wool free of duty. Since 1861, our tariff laws have recognized that our

wool manufacturers should be placed in the same position as if, like the European manufacturers, their wool were exempt from duty. A specific duty is placed upon the cloth, intended to exactly reimburse the duty paid on the wool. But this specific duty gives the manufacturer no protection: and he has at least equal claims to protection with the wool-grower; for, irrespectively of the wisdom of the policy of any protection, if it is adopted, it should be applied to all domestic industries. Our tariff laws therefore provide, in addition to the specific duty on fabrics, neutralizing the wool-duty, an *ad valorem* duty for the protection of the manufacturer. This system of compound duties is the only one which will permit protection to the grower without injury to the manufacturer. It was adopted after great deliberation, has proved highly advantageous to both interests, is attended with no difficulty in its administration, and should be retained.

American Mills the only Market for Domestic Wool. — We have deemed it proper to refer to these highly important relations of a wisely adjusted tariff to the wool manufacture; because the prosperity of wool-production and sheep husbandry at the South, and its further extension, absolutely depend upon the prosperity of the American wool manufacturers. It has been shown elsewhere that the value of all the wool exported from this country does not equal the value of the playing-cards which we have imported. For many years to come, the sole market for the wools of the South must be her own mills and those of the North. It is doubtful if the South will ever be able to export wools to foreign countries in competition with Australia, the Argentine Republic, southern Russia, and the Cape of Good Hope. The wool-growers of the South will, therefore, best advance their own interests by favoring the national policy which promotes, by reasonable and just provisions, the interests of their consumers, the manufacturers.

Wool-Growers' Associations. — The Southern wool-growers should, besides, establish direct relations with their consumers, the manufacturers, and consult them in regard to the character of wools required for fabrics; but, above all, should encour-

age the erection of woollen mills in their own country, that their market may be at their own doors. They should also cultivate relations with the wool-growers of the North and West, and enter into that community of sentiment and purpose required to make a great national wool industry. For this purpose, as well as for general improvement, wool-growers' and sheep-breeders' associations should be formed in each of the Southern States, as has been done in many States at the North and West. Nothing has contributed so much to the marvellous improvements which have been made of late years in this country as these associations. As an illustration of the high standards of excellence secured by these associations, we give in a note the programme of the Annual Fair of the Sheep-Breeders' and Wool-growers' Association of the State of New York.*

* *Annual Fair of the New York State Sheep-Breeders' and Wool-Growers' Association, at Hemlock Lake, N. Y., May 1st and 2d, 1878.*

CLASSIFICATION.

Prizes are offered on each division of three classes of sheep, as follows: First class. — AMERICAN MERINOS. *Div. 1.* — Bred for constitution, form, weight of fleece, quality adapted to manufacture of domestic woollens. *Div. 2.* — Bred for constitution, form, fineness of fleece, quality adapted to manufacture of broadcloths and similar fabrics. *Div. 3.* — Bred for constitution, form, length of staple (2½ inches at one year's growth being required), quality adapted to manufacture of delaines and similar fabrics. Second class. — *Div. 4.* — COTSWOLDS. *Div. 5.* — LINCOLNS. *Div. 6.* — LEICESTERS. Third Class. — *Div. 7* — DOWNS, or MIDDLE-WOOLLED.

PRIZES.

Prizes are offered in each of the above divisions, as follows: For the best ram, three years old and over, diploma; second best, \$10; third best, \$5.

For the best ram, two years old and under three, diploma; second best, \$10; third best, \$5.

For the best ram, one year old, diploma; second best, \$10; third best, \$5.

For the best pen of three ewes, three years old and over, diploma; second best, \$10; third best, \$5.

For the best pen of three ewes, two years old and under three, diploma; second best, \$10; third best, \$5.

For the best pen of three ewes, one year old, diploma; second best, \$10; third best, \$5.

SWEEPSTAKES.

The following Sweepstakes Premiums are offered in each of the seven divisions: —
For the best ram, of any age, diploma.

Sheep Husbandry by the Colored Population. — We must not ignore a present serious obstacle to sheep husbandry in the South, which is constantly referred to in the reports to the Department of Agriculture; viz., the destruction of sheep by

For the best flock of not less than fifteen, including at least one ram, owned by exhibitor sixty days next preceding the Fair, diploma.

For the best stock ram, and ten of his progeny, diploma.

For the best pen of three ewes, of any age, diploma.

Entrance-fee for Sweepstakes Premium, \$2 in addition to membership.

No sheep competing for the above prizes are required to be shorn.

SHEARING AND SCOURING TEST.

For the best ram's fleece, \$5; for the best ewe's fleece, \$5. For the best ram's fleece, scoured, \$5; for the best ewe's fleece, scoured, \$5. For the best fleece of scoured wool, in proportion to weight of carcass, \$5.

Sheep competing for the above prizes must be shorn on the grounds, and weighed before and after being shorn. Age of fleece to be given in each case. The Committee in making their awards shall make weight and quality combined the leading consideration, and shall withhold the award entirely where there is not sufficient merit. Entrance-fee, \$1, in addition to membership, for each sheep. Exhibitors to furnish their own shearers.

Prizes of \$5, \$3, and \$2 will be awarded to the first, second, and third best shearers.

REGULATIONS OF THE FAIR.

1. All premiums may be competed for by residents of the United States, or any other country. Persons competing for premiums must be members of the Association, by the payment of \$1 during the current year.

2. No pens shall be allotted to exhibitors until the first morning of the Fair, and then in the order of application. (The allotment of pens will be under the direction of the General Superintendent.)

3. Sheep competing for premiums must be entered, and brought upon the show-grounds, on the first day of the Fair; and they must not, without a special permit from the General Superintendent, be removed therefrom before the second day; nor, on the second day, until the General Superintendent shall, by direction of the Executive Board, make public proclamation that all exhibitors are at liberty to withdraw their sheep.

4. Exhibitors will be required to answer, under oath, according to their best knowledge and belief, the questions of the Examining Committee touching the age of their sheep, the age of their fleeces, the manner in which they were last shorn, the amount and kind of feed during the year preceding the Fair, their general treatment, and any special treatment intended to affect their condition or appearance.

5. No person shall act as a member of a Viewing Committee who has any direct or indirect pecuniary interest in any sheep submitted to the inspection of said Committee for a premium.

6. No premiums shall be awarded except on animals of superior merit, and then only such of the premiums as the Viewing Committee shall consider them

dogs, and the depredations of lawless negroes. It is said that public opinion among the masses of voters who at present control the representatives in many of the State legislatures will not permit the enactment of suitable laws to restrain the nuisance of dogs. "Local laws," says Mr. Peters, "for the protection of our flocks from man and beast, should be promptly enacted." "The main obstacles to the industry here" (South Carolina), says Colonel Watts, "are dogs, thieving negroes, indolence and ignorance. The presence of the shepherd and the Spanish sheep-dog will remedy the first; and education, the latter." Happily, the latter influence is now producing results in the South such as the most sanguine friends of humanity could not have dreamed of ten years ago. It was shown at the national convention of the teachers of the United States, recently held in Washington, that schools are being organized and conducted in the South after the best systems of New England and Europe; and that the most hearty co-operation exists between the great educators of the North and the South. Let there be added to this influence the education which is effected by interest. Let the colored people of the South have the means pointed out to them for their *material* improvement. What means so simple and ready as the encouragement of sheep-growing among these people, on a moderate scale, in the rural districts? Supposing, with a population of four million colored persons

entitled to. (Thus the third premium, or the second and third premiums, may be drawn, while the first is unawarded.)

7. All reports of Viewing Committee shall be made in writing, and signed by the members of the Committee agreeing to them. (Printed blank forms of reports, with instructions to Viewing Committees, will be delivered to the latter.)

8. The Viewing Committee shall deliver their reports to the President or Secretary, at or before 9 o'clock, A.M., on the second day of the Fair.

9. The Society reserves the right to pay the premiums in full, if the receipts are sufficient after paying expenses; otherwise, to pay *pro rata*, according to receipts of the Fair.

10. All sheep intended for exhibition must be upon the ground at 12 o'clock M., the first day of the Fair; at which time the entries will close.

11. All sheep over two years old competing for any prizes offered by the Society must have been closely and evenly shorn the previous year.

in the Southern States, there are four hundred thousand families, and each family should have six sheep, there would be 2,400,000 animals producing wool and mutton,—more than at present in all New England. This great accession to the wealth of the country would be nothing compared with the civilizing and humanizing influence of the pastoral occupation upon the population, and the habits of thrift which it would engender. How many thousand country boys at the North have got their first notions of economy and accumulation from having, for their *own*, the products and increase of a single sheep! The colored race, from their natural gentleness, take most kindly to the care of animals. Negroes, it is well known, make excellent shepherds, as they make capital hostlers. There are but few colored families which could not afford to purchase two or three ewes. The profits in that favored country, though small at first, would be sure. The increase would be limited only by the perseverance of the shepherd, and his command of land for pasturage,—probably the chief obstacle. Let sheep culture, upon ever so modest a scale, generally prevail among the colored people of the South, and dogs and thieves, white or black, would quickly disappear under the vigilance of a self-constituted police, more effective than any the law could provide; though laws would follow, and would be enforced.

Question of Over-production of Wool.—The question will naturally arise: If the South grows wool according to her capacity, will she have a market for her production? To the question proposed in this form, no other than a negative answer could be given. But the practical inquiry is this: Is there any reason in a probable glut of the market from an enlargement of the area of production which should deter a Southern farmer from embarking in wool-growing? And to this question we unhesitatingly answer, No. The fears of over-production, which give the disciples of Malthus and Ricardo so much apprehension, are rarely realized. They are never realized, except temporarily, in the great staples of manufacture. Production usually limits itself by its own operation. Thus, California, it is said, has reached its limit

in wool production by occupying all its pasture grounds, or by converting them from the domain of the crook to that of the plough. Lands in Vermont, Ohio, New York, and Michigan, first improved by sheep, have become too valuable for growing sheep for wool mainly; and these States are becoming producers of sheep for mutton and combing wool, and rams for breeding. High production of wool in one quarter of the world is usually attended by diminished production in another. While Australia has increased the numbers of her sheep so wonderfully, Germany has fallen off from 50,000,000 in 1850 to 25,000,000 at present, and France from 32,000,000 in 1839 to 24,000,000 in 1872. Thus, with all the supposed rapidity with which the production of wool has been increased throughout the world of late years, the actual consumption of raw wool, in the United Kingdom, the continent of Europe, and North America, has increased at the rate of but about two per cent for each year of the last decade. The consumption of clean wool in the United States is set down, for 1875, at four and one-third pounds per head of our population. This is far short of what we ought to consume for the required comfort of our whole population; and of what we would consume, if the producing and consuming power of our people were adequately developed. It is doubtful if half of our population wear the woollen underclothing required for health and comfort. Persons well informed in the trade in articles of this description have made the following curious estimate:—

“With a population of thirty-five millions, we may suppose that there are eight millions who, from poverty, mildness of climate, or other causes, do not wear stockings; leaving twenty-seven millions who will use at least three pairs per annum, requiring eighty-one million pairs, or six million seven hundred and fifty thousand dozen, the value of which, at \$3 per dozen, would be \$20,250,000. Estimating that there are eighteen million males, one half of whom will wear knit shirts and drawers, and allowing one shirt and one pair of drawers to each of the nine million males per annum, one million five hundred dozen will be required, at \$12 per dozen, of the value of \$18,000,000. Estimating that there are seventeen million females, one quarter of

whom will wear undervests and drawers, and allowing only one garment to each, three hundred and seventy-five thousand dozen, at \$12 per dozen, of a total value of \$4,500,000, will be required: making the whole value of the above staple goods alone required for American consumption \$42,750,000."

This statement illustrates how slight an increase of the consuming power of our population is required to expand the wool manufacture, and to create a home demand for the raw material such as never existed.

But the production of wool at the South will be so gradual in its increase that it will be a long time before it has any sensible effect upon the markets. It should be gradual, to be healthy and natural. It should spread, through the example of intelligent and cautious farmers. A sudden and general enthusiasm for sheep husbandry at the South would be as undesirable as the *morus multicaulis* and silk mania of 1839, which stopped the silk culture in many of the Southern States, where it might otherwise have been now successful. Despite the few brilliant exceptions in Texas, the *bonanzas* in sheep husbandry are as much fictions of the imagination as the pastorals of the poets. We do not tempt our Southern friends with the promise of

"A fleece more golden than that found in Greece,
Which venturous Jason on his Argo bore
From the lulled dragon and Colchian shore."

But we would allure them to an industry more certain of remuneration, from a moderate investment, than any other which can so easily be introduced upon their farms, and — what is far more important — an industry which will be the precursor of that diversified culture through which alone agriculture can be made permanently profitable.

In conclusion, we would express our obligations to Mr. Peters of Georgia, Mr. Watts of South Carolina, Mr. Young of North Carolina, and Mr. Shaeffer of Texas, for the valuable statements and information furnished to us; and to Mr. C. W. Jenks of Boston, for the high intelligence and zeal manifested by him in the collection of much of the material embodied in this paper.

APPENDIX.

SHEEP HUSBANDRY IN NORTH CAROLINA.

THE developments of science and practical experience have revolutionized public opinion on many important subjects during the present generation. Man's cupidity, as well as necessity, has urged him to important changes of sentiment, or, more properly speaking, has induced him to develop to our intelligence many errors under which our fathers labored, and has opened doors to new enterprises, through which the progress of this age has advanced his material prosperity far beyond any period in his history. This progress is not destined to be stayed; but, on the contrary, as, step by step, new developments are unfolded, new fields will be presented for exploration, and new enterprises opened for the employment of his energies. Looking back from the threshold of the last quarter of the nineteenth century to its commencement, we perceive that more has been accomplished, in scientific and practical development, than is recorded in the history of combined centuries of man's preceding existence; and yet all that he has done has been simply to develop and turn to his use the blessings given by his Creator in the beginning.

During this period, cotton has been introduced into the Southern States of our Union, and become their great staple, and made one of the leading productions of our country; and, entering largely into the channels of commerce, has contributed no small share in building up that interest. The labor system of the South favored its cultivation, while the soil and climate suited its growth and development. The profit attending its production induced its cultivation in States too far north of the line of latitude suiting the tender nature of the plant to render it a reliable and remunerative staple to the planter. The recent change of labor in the Southern States renders it important that those more northern States which border on the cotton belt should turn their attention to productions that promise better remuneration.

The State of North Carolina, lying on the northern border of the cotton belt and between the 34° and 37° of north latitude, possesses a medium temperature of climate, free from the severities of blighting cold as well as from the debilitating and parching heat from equatorial influences. Thus relieved from the extremes of climate, North Carolina possesses that equable temperature which is peculiarly healthful and invigorating to man, as well as to all animated nature. This geographical advantage is enhanced by its topographical formation. With a seacoast of near three hundred miles' extent, washed by the waves of the Atlantic, it reaches back westward, until it embraces the towering heights of the Blue Mountains. From the exhaustless fountains of this mountain region flow the thousand streamlets which form her Catawba and her Yadkin Rivers; and from her table-lands, which gently soften down towards the coast, a thousand other never-failing brooks and rivulets are gathered into her noble Cape Fear, her Neuse, her Tar, and her Roanoke Rivers, all flowing eastward, watering abundantly every district of the State, and emptying their waters into the Atlantic.

The mountain portion of North Carolina, embracing some twenty counties, possesses a soil unsurpassed for fertility by any similar extent of mountain country on our continent. Here the celebrated blue grass is an indigenous growth; and the mountain sides and alluvial valleys alike make the finest meadows of this favorite and never-failing pasturage. The winters here are short, and free from that intensity which characterizes more northern latitudes. This mountain portion of the State softens down eastward into a hill and dale plateau, embracing as many more counties; and this is succeeded by a lovely champaign country, extending to the Atlantic coast. The soil of this extensive mountain and upland country, embracing some sixty of the ninety-one counties in the State, is varied in character: a large proportion of it, having a rich clay subsoil, yields abundant crops of the cereals and of cotton and tobacco; and the balance, having an admixture of sand, is more easily cultivated, and, with light fertilization, yields quite as abundant harvests. All is susceptible of the highest degree of improvement; and all produces native, as well as sown and cultivated, grasses, to a high degree of perfection. The remaining counties, embracing the tide-water district of the State, have large districts of rich alluvial soil, which have long been an Egypt from which thousands of our fellow-citizens north of us have been provisioned. Within the limits of the State, there are fifteen hundred miles of railroad; traversing it longitudinally, latitudinally, and diagonally, penetrating its moun-

tains at different points, and now vigorously pressing through to a connection with the Mississippi and Ohio valleys. These highways of travel and freight open up every portion of it, and make connections at Wilmington, Morehead City, and Newbern, on its own seaboard, and the ports of Charleston, S. C., Norfolk, Va., and the cities and markets of the North.

This portraiture of the State of North Carolina presents an area of 45,500 square miles, and embraces all the varieties of soil and climate to be found in the most favored latitudes and most desirable localities on the earth. Nature has not distributed her gifts here with a partial hand, by bestowing lavishly upon one section and withholding to impoverishment from another; but, by an even and uniform meting out, renders every portion desirable. From the sharp frost-line of its mountains to the sunny bays and lakes upon its coast, where ice is rarely seen, a uniform, equable temperature pervades the State.

The radical change in labor in the last dozen years renders necessary a corresponding change in the system of agriculture, which must, in future, be pursued by the people. He who will present a proper direction for the enterprise of agriculturalists will be their benefactor. Our ideas on such matters are naturally influenced by our business of life, our education, or other circumstances which bend the twig and fix the inclination of the tree. Being sensible of these influences, the writer might feel more diffidence in presenting sheep husbandry to the consideration of those interested in the future of North Carolina, as the leading occupation of its people, did he not feel satisfied that an intelligent examination of the subject must lead the investigating mind to sustain his conclusions.

If the preceding description of the temperature, topography, and general characteristics of the State be correct, the reader who is familiar with sheep husbandry will at once perceive its adaptation to that pursuit. Every one desiring to inform himself more particularly in regard to the representations here given is invited to direct his investigations with the view of scrutinizing its correctness and reliability.

Twenty years' experience in manufacturing the wools grown in the State has familiarized the writer with the manner in which our sheep have been cared for; and has convinced him that, without great natural advantages, their utter neglect would long since have exterminated them from the soil. There are but few plantations in the State upon which there was not to be found a flock of sheep, intended to be *only* sufficient to furnish the wool necessary to clothe the family, and furnish an occasional mutton. These sheep were generally the

"native" breed, rarely improved by crosses upon foreign blood. As a general rule, these small flocks never entered into their owner's estimate of his valuable property, and they were never so treated. In the spring, they were shorn of their fleeces, and turned outside their owner's enclosures to seek their summer support in the forests and waste lands, over which they chose to roam, and to run the gauntlet for life among hungry hounds and gaunt curs, almost as numerous as themselves. All that might escape, and were able to find their homes in the fall season, and would seek its inhospitalities for the winter, would be admitted within the gates, and permitted to eke out a scanty living in the denuded fields and corners of worm-fences; which is supplemented by a morning and evening allowance of corn fodder, which the compassionate and appreciative owner *allows* to be fed to them by a boy who has not yet attained sufficient size to be otherwise useful. The only protection against the rains and occasional storms of winter afforded to a majority of these flocks being such as their instincts lead them to seek by hovering on the sheltering sides of barns and outbuildings that may be accessible, a tumble-down or waste-house on a plantation is a perfect asylum for them. Yet, under this treatment, the flocks of the farmers keep their numbers full, and occasionally multiply beyond their wants. Of necessity, their fleeces are light and inferior. Whenever an effort has been made to improve the stock by crossing upon merino or other approved blood, the effect is satisfactory and lasting. From the universal custom of turning the entire stocks into the common "range," the impression of a merino, Southdown, or other importation, would manifest itself upon the flocks of entire neighborhoods. So apparent is the improvement thus made, that, in purchasing the surplus brought to market, there would be no difficulty in recognizing the wool from a neighborhood that had been favored by some enterprising farmer having imported from Virginia or Pennsylvania a pair of blooded animals. Without any change in the mode of treatment, these improvements are known to be distinctly manifest in neighborhoods thirty years after their introduction. Being able to withstand all this hardship and neglect, and promptly to respond to every effort to improve their quality or condition, it is evident that there is in North Carolina an adaptation of natural gifts to their peculiar wants.

In the tide-water and contiguous counties, where the influence of winter winds from the mountains is not felt, "where the snow spirit never comes, and where spring flings her flowers into the lap of winter," these generous animals find a sustaining pasturage, the entire year, upon the wire grass which grows spontaneously through the otherwise

barren pine forests. Being thus independent of their owners, they keep in uniform good flesh, grow to better maturity, and furnish better fleeces, than in the upper portion of the State. Though here they know neither their "owner, nor their master's crib," they contribute largely to clothing and feeding his family.

Standing on Mount Mitchel, on the western border of the State, the most elevated point between the Mississippi River and the Atlantic, looking eastward the mind's eye reaches the waves of the Atlantic, five hundred miles distant, and sweeps over an area of 45,500 square miles, embraced within the State lines, watered by thousands of tributaries to noble rivers, which gush from the mountain battlements stretched across the western border of the State, whose waters, flowing eastward, tumble over innumerable falls; as though Nature had given them, not only to beautify the landscape, but to invite the enterprise of man to their utilization. From the broad plateau below, a thousand other never-failing fountains send forth their pure waters, which mingle as they flow onward to swell the grand arteries which convey them to their common reservoir. Through, over, and across this grand prospect, numerous railways stretch their lengths, over which freighted trains are sweeping to and fro; bearing out the productions, and bringing in the commerce, of the country.

Of this immense territory it may be said, there is not a square mile of soil which is not susceptible of being made to produce a remunerative yield to tillage, and not one upon which would not ordinarily be found a good natural pasturage for sheep; nor is there a square mile of it upon which, when sheep were introduced and cared for, would not, year by year, be improved by their presence and pasturage upon it. There is no part of the State which does not possess immense natural advantages in soil and climate over the Southdown hills of England, the sterility of which rendered them almost uninhabitable, until sheep were introduced upon them, by which they have been converted into the greenest meadows of the island. In the mountains and hill country more winter provisions would be required than in the balance of the State; but the shortness of the season would not demand much expense, nor render the care of flocks burdensome. In three-fourths of the State, no other winter provision would be necessary than the sowing of grasses and small grain for their pasturage, and the providing of cheap shelters from occasional seasons of inclemency. The farmers have practised the habit of grazing their sheep upon their fields of small grain during the winter, which, when judiciously done, rather contributes to, than detracts from, their yield at harvest. In the pine

lands and tide-water portion of the State, they do live independent of the care of man, but would certainly reward him for care and attention.

If climate and soil are adapted to sheep husbandry, Nature has furnished her share of the requisites. Man must supply the flocks, and, in obedience to the divine command, till the earth for their subsistence. Sheep-growing in certain of the States of New England, where pasture lands are worth five or ten times as much as in North Carolina, is the staple business in its rural districts. Its people look to their flocks, as the Southern planter does to his broad acres of cotton, for their income. There the severities of a Northern winter lock up all Nature's supplies, and render all domestic animals dependent upon the hand of man for protection and food for one-third of each year; yet that enterprising people have converted these States into a vast sheep-walk, and, subduing all obstacles, have developed the wool-bearing capability of sheep to a degree heretofore unknown. A contrast between the advantages and disadvantages of New England and North Carolina in regard to this profitable enterprise is invited, and the advantages of the latter will be apparent. If, with the natural disadvantages under which they labor, they have developed so great a profit in this pursuit, why should not North Carolina become animated with the abounding presence of this valuable animal? Why should not her hills and dales be made vocal with bleating flocks, and the song of the shepherd awaken her echoes as they float over her fertile vales and picturesque landscapes? Why should our farmers, year after year, spend their hard earnings for commercial fertilizers, and wear out their physical energies in toil and labor to make money enough to buy more artificial manures, to enable them to grow more cotton, when the presence of one hundred sheep upon his lands would enrich five acres every month in the year, far better than their purchased fertilizers; and would, at the same time, pay them in wool and mutton a better per cent upon their value than their cotton does upon their labor and expense?

The changed circumstances of the people of North Carolina calls for a change in their agriculture. Millions of wealth have been realized in less favored countries by the growth of sheep; and it is an enterprise worthy the investigation of her people. This article is not written with the view of presenting the profits of husbandry, or of contrasting it with the present agricultural pursuits of her people; but to show the adaptation of the State to its successful pursuit, and to call attention to its natural advantages over countries where it is profitably pursued. It is hoped that the intelligent people of the State will investigate the subject, and that those engaged in it elsewhere may be

induced to direct their attention and inquiries to the State; and there is no doubt of the facts presented being found to be as stated.

The profits of sheep husbandry are not now, as heretofore, dependent mainly upon the fleeces; but the discoveries of science in this, our enlightened day, enable the growers to offer their mutton in the markets of Europe as sweet and as fresh as it is found in our own city shambles.

JOHN A. YOUNG.

CHARLOTTE, N. C., Jan. 8, 1878.

MARTIN'S DEPOT, LAURENS COUNTY,
SOUTH CAROLINA, Dec. 22, 1877.

JOHN L. HAYES, Esq., *Secretary of the*
National Association of Wool Manufacturers, Boston.

DEAR SIR, — I am requested by my friend, Governor Hampton, to send you some details of my experience in sheep husbandry, in which I have all my life been engaged, in this State, Georgia, and Texas. From my early manhood, I have personally known, and visited in their homes, the most intelligent wool-growers and sheep-breeders of the North and South, — such men as George Campbell and others, of New England; and Richard Peters and others, of the South. Dr. Randall, of Cortland Village, N. Y., was for thirty years my friend, and an authority to whom I always had recourse; and whose most valuable work, "Sheep Husbandry at the South," was written at the special request of the late Governor Allston, of this State, to encourage wool-growing in South Carolina. From all sources, at home and abroad, I have sought information, and have obtained the best examples of the various breeds. In fact, sheep husbandry has been the one occupation I have preferred above all others; and I have no hesitation whatever, after long experience, in affirming it, as my fixed belief, that it might be made *the* most valuable industry of the South; and for the successful pursuit of which, in all its varieties, this section has more facilities than any other portion of our country. I will note down facts in my experience, as they occur to me; and you can arrange and use them as you choose.

We are not far from the central portions of the State.

The country is a rolling upland, with a light-gray soil and heavy clay subsoil.

The prevailing grasses are the crab and Bermuda, and wild clover.

The breeds of sheep I have had and tested are the common native; Bakewell, or New Leicester; New Oxfordshire; South Downs; French and Spanish merinos; and the African broad-tails.

With me, the Spanish merinos have proved the most profitable; the first of which I had from the flocks of Dr. Randall.

I have crossed the merino with nearly all the above-named breeds.

I am inclined to think that good native ewes make the best cross with the merino, and make a more salable sheep than any of the above-named full-bloods.

I am now breeding the merino and broad-tailed.

If I were raising wool as the primary consideration, I would by all means raise the merino. They do not mature so early as the other breeds; but, when matured, make as good mutton as any breed I have ever raised. But, if the principal object should be to raise mutton for the markets, I would certainly recommend the African broad-tailed sheep, because they mature earlier; but, in my husbandry, I make the wool the first, the mutton the secondary, consideration. But, were the question one of long-combing wool for this locality, I would cross the Cotswold ewe with the African broad-tail ram, for all the range of country *here*, this side the Blue Ridge.

The annual cost of keeping my sheep, I charge up at one dollar per head. The *actual* cost I have found to be not over sixty cents per head.

As to the per cent of profit my sheep pay: if they are full-blooded, they will average not far from ten dollars; and, making that, they give about twenty per cent., allowing the lambs to pay expenses; but, if they are only half-breeds, they will not average more than a dollar and a half per fleece.

My average annual clip of unwashed wool, per sheep, from full-blood merinos, is seven pounds: the average price of which last season was twenty-two cents; this season, twenty-eight, net, to me here.

I think the cost per pound of wool gives it to you as net gain; for it must be a very poor and very badly managed flock in which the lambs and manure will not pay *all expenses*.

The average number of my lambs raised is, from my merinos, about eighty per cent. Compared with the ewes kept, they are not, as a rule, as good nurses as most of the other breeds; some of which will rear nearly one hundred per cent of their lambs. I have always sold my lambs for herding, stock sheep, &c., — not to the butcher.

Our common sheep can be had here for two dollars per head;

merinos, from ten to twenty. The price in market here for grown mutton sheep would be from four to five dollars.

My pasture has been broom sedge and Japan clover (*Lespedeza striata*), until after harvest; then we give them the run of the grain fields. For winter pasturage, I usually sow rye lots for the ewes and lambs, and give all the flock the run of oats sown in August and September; also, allow them the range of the corn-field and the cotton-fields. As a mixed food, cotton-seed is wholesome, economical, and profitable. My sheep are very fond of it: after feeding on green barley all day, they will eat cotton-seed with great relish. Some feed is needed in this section for three months, as there are little cultivated grasses; with herdsgrass and clover cultivated, much less time for feeding would be needed.

Sheep are usually very healthy in this section: there are no epidemics nor prevailing complaints here among them.

The main obstacles to the industry here are dogs, thieving negroes, indolence, and ignorance. The presence of a shepherd and the Spanish sheep-dog will remedy the first; and education, the latter.

We utilize the manure from the sheep,—housing them in winter, and littering the stalls frequently,—throwing it broadcast for rutabagas, in July or August, or in drills, as the case may be. In summer, I use John H. Ruchman's portable fence,—the best iron wire; and keep at the rate of a thousand sheep to the acre a week: the value of which I regard as equal to about four hundred pounds of guano, the first year; and its effects are perceptible for several years. My belief, from careful experimenting, is, that fifty-two acres of land can be so well fertilized in twelve months, with one thousand sheep, as to be rich soil for five years following. The effects of such manuring are wonderful.

The sheep are great helps to the farmer in eradicating useless weeds, such as the cockle-brier, which they eat with avidity, either dry or green. In fact, there are few plants with us they will not eat.

I think all varieties of sheep can be successfully and profitably raised in our State. On the rich bottom lands of the coast, the African broad-tails,—or a cross, as I have suggested, with the Cotswold,—which would give a variety that would thrive in any climate South.

In the middle district, near the lands under rich cultivation, the Bakewells and other varieties of heavy sheep for mutton. In the section where I am, and up to the line of the Blue Ridge, the merinos, and, on the Blue Ridge itself, the merino; and I should also strongly recommend the Cheviot, so successful in the districts of England and Scotland of similar altitude and climate.

And here, in closing, let me say, in view of some of the industrial wants of the country, I think this last section of our State, the Blue Ridge Mountains, can, with moderate care and expense, most successfully furnish all the facilities needed for the best combing-wools, and the alpaca and Angora goat. In fact, I have no doubt on this point. Even here, seventy-five miles from the mountains, I have for six years grown most successfully the Angora goat, whose flesh I regard as superior to any mutton; and whose fleece, properly handled, could there be made more profitable than any wool-growing. This I can say from actual, careful experience with the Angoras which are of Asia Minor stock, meeting here few obstacles to their profitable breeding; and which, in the Blue Ridge just beyond me, would find an exact counterpoint of their native soil and climate. Aside from their flesh and wool, there is another advantage they offer, which in the mountains beyond would be most valuable. In a cross I have made with a pure Angora buck and a Maltese ewe-goat, I have raised a ewe-goat that will give four quarts per day of as good milk as any cow on my plantation. The feed of one of my cows will keep twelve goats. My cows must have certain food, or they will not thrive. My goats will eat any thing almost, and do well; and with this advantage, also, that their milk and butter are not in any way affected by their diet.

It is not, therefore, at all an open question with me, after years of practical experience, whether the Angora, alpaca, and kindred races of the goat tribes would thrive in our Blue Ridge. They would be more profitable in that locality than any other branch of husbandry.

If the present *status* of the wool-growing industry can be maintained, we can, in my judgment, grow all the varieties and product needed for home consumption, from the cheapest carpet-wools to those needed for our extra-fine broadcloths, imitation cashmeres, or the cloths for piano-manufacture consumption.

I have now on my table a Silesian wool, measuring, say, eighteen hundred hairs to the inch, and which cost the consumer here one dollar fifty cents, in gold, per pound. With none of that ridiculously extreme care which the growers of Electoral wool exercise in their flocks, Mark Cockerell, of Tennessee (near Nashville), has raised Saxony wools of a fineness of over two thousand hairs to the inch, and could sell it at a handsome profit at one dollar per pound. In fact, Mr. Cockerell claims there is more margin of profit in it than in the growth of a mere ordinary wool.

Our country's enterprise, demand, climate, soils, and constantly improving animals, — if present encouragement in wool-growing is not

interfered with in any way, — can supply any call that can be made upon it; and, from my knowledge of the South and its resources, I believe no part of our country can furnish so many facilities in this direction, — and no one section more than my native State of South Carolina.

J. WASH WATTS.

EXECUTIVE CHAMBER, COLUMBIA, S. C., Dec. 24, 1877.

I fully concur with the views expressed by Colonel Watts in the within paper. He is a gentleman of great experience, intelligence, and integrity. I doubt if he has his superior as a shepherd in the South.

I heartily commend his sentiments, as hereby expressed, to all who are interested in wool-growing and its manufactures; which industries I believe to be most vitally connected with the future development and prosperity of the South.

WADE HAMPTON.

ATLANTA, GA., Jan. 1, 1878.

JOHN L. HAYES, Esq., *Secretary of the*
National Association of Wool Manufacturers, Boston, Mass.

SIR, — Hon. Alex. H. Stephens of this State has expressed a wish that I furnish you with facts as to the facilities the State of Georgia can offer in sheep husbandry, growing out of my thirty years' experience in that industry here.

If you will bear in mind that we can grow oranges in the gardens in the southern part of the State while snow lies on the highlands, and the mercury may be at zero on the northern borders, you can see that the diversity of soil and climate associated with such extremes would give great variety to the products of the State.

Nature has given us three marked divisions: middle, lower, and upper Georgia; the altitude rising with the latitude. Each of these sections has its own special advantage for wool-growing, and it can be profitably pursued in either section.

I will begin with the lower part of the State, across the entire width of which there is a belt of country of an extent northward from the coast and the Florida line, say, from 100 to 150 miles. It is the land of the long-leaf pine and the wire grass. Flocks of native sheep,

as high as 3,500 in number, are found here and there scattered over the surface; receiving but little care or attention, except at the annual gathering for shearing and marking. Very little can be said either for the quantity or quality of the wool per head raised here. I am aware that it has been claimed for this section that its present advantages are as great for large flocks as the ranges in Texas and California. I do not subscribe to this opinion. The pasturage of this section, called wire grass, affords fine grazing for sheep in the spring; but, for permanent and continuous food, it cannot be relied on. A fair experiment in sheep-raising, uniting good attention, selection, and crossing, with a determination to secure the best development in frame and fleece, has not been made in this section for many years. If it were properly attempted, by combining Bermuda with the wire grass for spring and summer pasture, and red winter oats for one or two months in winter, for the ewes and lambs, I think the results would prove of the most satisfactory and profitable character.

In the middle portion of the State, the Bermuda grass prevails; and, under the cotton system of culture, it was the dread and bane of the planter: but now, for its nutritious qualities and compactness of sod, it is considered by our people as valuable and as reliable as any grass, not excepting the Kentucky blue grass. It is undoubtedly the sacred, or "doub," grass of the Hindoos. It will afford sheep the very best pasturage for six months of the year, in this section of the State; and, if managed as on the pastures in Kentucky, for the entire year.

In Putnam, Hancock, Wilkes, and adjoining counties (formerly the *el dorado* cotton country of Georgia), where the Bermuda has taken possession, there is a future for successful sheep husbandry; providing, of course, the supervision be intelligent, and the business properly conducted, and combined with cotton culture. The result must prove highly remunerative, — far surpassing any thing in the past history of this industry in New England or the Middle States.

My own experience has been, to a great extent, in North or upper Georgia, in Gordon County. The country is hill and valley, the land changing very rapidly; the pasturage, sedge, crab, and other native grasses. Of the cultivated, the orchard grass, red and white clover, on upland, and red top, on low land, succeed admirably. Lucerne and German millet are never-failing sources of an ample supply of hay. The former affords from four to five cuttings in a season. Red, rust-proof oats — a reliable winter variety, if sown in September — can be pastured during the winter and early spring, and then yield a full crop of grain. The same may be said of barley, rye, and wheat.

The breeds I have tested are the Spanish and French merinos, South Down, Oxfordshire Down, Leicester, Asiatic broad tail, or Tunisian, improved Kentucky Cotswold, and native sheep. I have also crossed nearly all of these varieties. Those between the Spanish merinos and native, and the Cotswold and native, have proved most profitable. My present varieties are the thorough-bred merinos and the Cotswold, and crosses between these two.

For general purposes of wool and mutton, I recommend most decidedly the cross from native ewes and Spanish merino bucks; the progeny showing marked improvement, having constitution, fattening properties, thriftiness, and a close, compact fleece.

For long-combing wools, the best combination flock can be built up on the natives as a basis; using the Spanish merino bucks for the first cross, and then the Cotswold to give more size and longer staple. If the winters are mild, my flocks require feeding about thirty days; if cold and wet, twice that time. My merino sheep are very healthy. They have had trouble with the sheep bot-fly; but I have found a liberal use of tar a perfect preventive. By another winter, a proper dog law will be enacted, now guaranteed to us in the new constitution.

In all well-situated and well-managed flocks, the increase and manure will amply repay all expenses, and leave the fleece clear profit. The fleeces of my flocks, not housed at night, will give an average of seven pounds of wool to the head.

The future history of the sheep husbandry of this State, if intelligently pursued in accordance with its natural divisions, will show three distinct systems: that of Northern Georgia will somewhat resemble the industry in Ohio, Pennsylvania, New York, and New England; that of the middle of the State, Kentucky; and that of the southern portion (with shepherds and dogs), Texas, Colorado, and California.

In this connection, I may say a few words about the Angora goat, very improperly termed "Cashmere." I have owned these animals from six distinct importations; those brought over by Dr. J. B. Davis, in 1848, proving to be superior in many respects to any of the more recent importations. One of the most valuable, interesting, and remarkable traits of the Angoras is the rapidity with which fleece-bearing goats can be obtained by using thorough-bred bucks to cross on the common short-haired ewe-goats of the country. The second cross produces a goat with a skin valued for rugs, mats, and gloves. The fifth cross, (known by many breeders as "full blood") will yield a fleece not inferior to much of the "mohair" imported from Asia. This fifth cross can be readily obtained in five or six years. Thorough-bred

bucks should always be used, because the progeny of the "full blood" bucks vary greatly, and the upward progress is by no means satisfactory. The Angora is a hardy, industrious, and self-sustaining animal, and can be classed as herbivorous. Being active and vigorous, they roam over wide ranges of country, giving value to worthless vegetation refused by most other animals; and will feed and fatten at double the distance from water that sheep can, as they travel faster and endure more. I have for twenty years bred them largely, and have observed the following rules in my selection of stock bucks:—

In pedigree. — Dating back to Asiatic importation.

In fleece. — Weight and length of the long, silky, ringletted, white fleece, and its freedom from kemp, and mane on the back and neck.

In frame. — Size and vigor, long pendent ears, and upright spiral horns.

If that point has not already been reached, I believe it soon will be, when (as in the history of merino sheep) finer specimens of the Angora, American bred, may be seen here than can be found in their haunts in Asia Minor.

I have had great success with the Angoras, and regard them as one of the most valuable acquisitions to the resources of our husbandry. They have yielded me more substantial pecuniary profit than any other branch of my extended stock investments. In 1861, I sent out to William M. Landrum, of California, the first Angoras that went there; where they have laid the foundation of what, I am confident, will be a very extensive and profitable husbandry. There can be no doubt that in the range of the Blue Ridge, extending from Alabama to Virginia they would find all the requirements of their nature, utilize a vast country, and prove a source of great benefit and profit to all interested. In reference to the whole matter of sheep husbandry at the South, after a long experience, in which neither labor, care, nor expense has been spared by me, I may say, with safety, I know of no investment so likely to yield constant and profitable returns to the farmer and certainly none so valuable to the acres he occupies. I think the State of Georgia, from its varied climate, soil, and surface, offers unequalled facilities for this industry. We shall need with this, the paternal care of the State and National governments, for its growth and permanence. Local laws for the protection of our flocks from man and beast should be promptly enacted; while the general government should by no unkindly legislation disturb existing advantages, retard our growing progress, or throw any obstacle in our way. And I may

here say, that I learn with great surprise and regret, that an effort will probably be made in Congress, this winter, to reduce the duties on wool, or even to give us free wool altogether. I greatly deprecate all such legislative action. Nothing could be more impolitic, or disastrous to the sheep husbandry of this country. No section of the Union — not even California and Texas, with all their great natural facilities — could grow wool against the cheap labor and the inexpensive ranges of Brazil and Australia; to say nothing of our European competitors, the influx of whose combing wools would keep, for many generations, the fair Blue Ridge of the South without sheep-walks; though it is by nature one of the most favored spots in America for this class of wools, and which also are now so much in demand, at home and abroad, for the great and growing worsted industries of the world.

To us of the South, especially (who are just waking up to the importance and value every way, of an intelligent sheep husbandry, as one of the most reliable and efficient means to aid us in the restoration of our shattered fortunes), any such unkindly legislation would be instantly and totally destructive. The capital of our farmers, now invested to a limited extent hopefully and profitably in wool-growing, their calculations and expectations being based on the permanence of existing legislation, would be annihilated; while the present encouraging outlook for investment in this industry, from outside capitalists, would be at once shrouded in gloom and indefinitely postponed.

Respectfully yours,

RICHARD PETERS.

MERINO RANCHE, MORGAN MILLS, ERATH CO.,
TEXAS, NOV. 13, 1877.

HON. JOHN L. HAYES, *Secretary of the*
National Association of Wool Manufacturers, Boston.

SIR, — I trust you will pardon the liberty I take in addressing you. My excuse must be the obligation I am under, to yourself and the Association you represent, for many favors in the past; and, very recently, for the pleasure and profit afforded me by the perusal, in the July and September issue of "The Bulletin," of your lecture on "Wool Production and Sheep Husbandry."

My only regret in reading it has been that your audience had not been in Texas rather than Maine; and here (will you allow me to say?) you are, in my judgment, doing the joint interests of wool-growing

and wool-manufacture great service, by the utterance of such sentiments as are contained in the paper referred to ; and, while thus employed, I firmly believe you are engaged in an educational effort second to none in importance in our country.

I have entered upon the business of sheep husbandry in this section, not alone for the purpose of money-making, but also in the faith that I can, in this avocation, render good service to my country in many ways. The field here is a wide and important one. I believe it is destined to be the theatre of most important developments in sheep husbandry. The facilities, in many directions, for the successful solution of hitherto unsolved problems in this industry, are unsurpassed anywhere ; and I think, ten years from now Texas wool will rank in all respects with the best of the world.

To accomplish this will require effort. I do not hesitate to say to our wool-growers here, that the intelligent wool-manufacturers of New England will watch with much interest the future of this great territory ; and that the knowledge of that fact, and the sympathy and co-operation it insures, should nerve them not only to grow the most in bulk, but the best in quality, of any wools on the continent.

I have recently brought out here one hundred head of merino bucks, from the celebrated flock of George Campbell, Esq., of West Westminster, Vermont, and intend them as but the forerunners of a system of sheep husbandry unexcelled anywhere. If I can be successful, I think I may be useful, in no small degree, in more firmly cementing the bonds of our common country. For, while it may seem a strange thought to many, I have the impression, that no one influence in the industries of the Union can be made more mighty for good in a moral, industrial, and political sense, than an intelligent, harmonious co-operation of the interests represented by the wool-growers and wool-manufacturers of these United States.

Very respectfully yours,

CHARLES N. JENKS.

EXTRACT FROM FORTHCOMING REPORT

OF THE

COMMISSIONER OF AGRICULTURE OF TENNESSEE.

EAST TENNESSEE FOR SHEEP.

THE climate embraced within the limits of Tennessee is peculiar, in the fact that it is greatly modified by reason of mountain elevations, and is not what latitude alone would determine. Take the tops of the Unaka Mountains on the east, and, throughout the hottest summer months, the average temperature on Roane mountain does not exceed fifty-four degrees. In the valley of East Tennessee, we find the climate not so much modified by elevation as by the direction of the winds which rush up the valleys from the south-west, laden with a fructifying moisture, and producing a highly genial, productive, and healthy climate. The mean temperature here in summer is not far from seventy-four degrees.

Take these two divisions of the State, lying side by side, and the sheep will present great constitutional differences. The Cotswold, Leicester, Southdown, nor any heavy breeds, would not do well upon the admirable grazing grounds found upon the bald places on the mountain tops; but the Merino, the Cheviot, and the native mountain breeds would find a home entirely congenial to their constitution and habits. The natives found on these mountain heights are as fleet as the deer, and as healthy. The wool is white, soft, firm, lustrous, and true; and the sheep show a beautiful adaptation to the locality which they occupy. It is said, by those experienced in sheep-raising on these mountains, that the higher the grazing grounds the better the wool. On the other hand, carcasses increase in size as the grazing grounds approach the valley, until the largest size of carcass is met with in the many long, straight, and beautiful valleys that characterize the great valley of East Tennessee.

It may be well to mention here, that the grasses which flourish upon the slopes and tops of the Unaka Mountains are exceedingly luxuriant and nutritious, and form a thick mat all over the surface. Blue grass, herds grass, white clover, mountain meadow, Randall grass, and many wild but valuable kinds, are so intermixed as to supply constant grazing throughout the summer months. But these grasses are confined to the soils of Metamorphic origin. The Sandstone Mountains are naked and bare, producing only greenish briars, lichens, mosses, and ferns.

Though cool, the climate of these mountains is exceedingly moist. For fully half the time in summer, the tops are wrapped in cloud and mist; and rains are remarkably frequent in summer, and snows in winter. The frequent rains keep the grasses in a growing condition, and an equal acreage of pasture upon the rich, black, feldspathic soils of the mountain will probably supply double the grazing that it would in the valleys below. In no part of the celebrated blue-grass region of Kentucky is the sod better or thicker than upon the balds of some of these mountains. For wool-producing sheep, this region has no superior in this or any other country, if they could be provided with suitable protection against the chilling rains. The cold blasts of winter may be averted by the sheltering coves. The tropical heats of the valley in summer are unknown upon these airy heights.

CUMBERLAND MOUNTAIN FOR SHEEP.

The Cumberland table-land is two thousand feet above tide-water, with a dry sandstone soil, and an exceedingly cool and pleasant climate in summer, the mean temperature being about seventy-one degrees. The air is dry and bracing. During the summer months, the surface of the earth is covered with tussocks of fine, nutritious mountain grass, and furnish ample sustenance for sheep for eight months in the year. In addition to the wild grasses, herds grass, clover, and orchard grass, with slight attention to manuring, will grow well. Wild peas also furnish a nutritious herbage. The soil can easily be made to yield sufficient supplies for winter feeding, by sowing in stock peas, — a food not only healthful for sheep, but highly relished by cattle.

To be successful in sheep-raising on this table-land, the breeder must be careful to build shelters for protecting his flocks from the middle of November until the middle of March. The climate is very rigorous in winter; and the keen northern and north-western blasts will speedily impair the health of the improved, though tender breeds. The native sheep are very healthy, and rarely suffer from any disease;

though they are not profitable, the wool being coarse and short, and the carcass light and lean. This arises, however, more from neglect than local cause. It should never be forgotten that thrifty flocks may be raised wherever industrious men and good breeders live; and that the best flocks will degenerate where inattention and neglect are practised.

The advantages offered by this mountain region for the economical rearing of sheep are:—

1. The cheapness of the lands. Lands may be bought at almost a nominal price on the Cumberland Mountains. Though high and healthy, the soil in comparison with that of the valleys is poor and unproductive. The price for wild, highway-pasture land varies from 50 cents to \$3 per acre; depending mainly upon nearness to railroads and markets. Care should be taken, though, to investigate the titles thoroughly; for one of the most unwise acts of our past legislation was the opening of a land-office, and allowing every one to make his own surveys, and receive a grant for lands based upon such surveys. Oftentimes it happened that the same land had been entered, in whole or in part, by others. The possession of a land grant does not carry with it in this State a title; but the title rests with the oldest grant, assuming it to have been regularly entered at first. Let strangers beware of purchasing mountain lands, without a rigid investigation of title. I am led to make these remarks because complaints have reached this office that persons have been swindled in purchasing land grants. There is no difficulty about securing good titles to valley lands; but there is danger that a person may buy land upon the mountain with a grant from the State, bearing the great seal of authority, and have no title.

2. The second advantage these mountain lands offer for sheep-raising is in the wide range of pasturage. The open woods permit the luxuriant growth of nutritious herbs and grasses throughout the summer, and will subsist millions of sheep for eight months in the year, without any other care than salting.

3. A third advantage may be found in the dryness of the sandstone soil, which insures exemption from many of the diseases fatal to sheep. No foot-ail, no braxy, no impaired organs of digestion, no blind staggers, and indeed no other disease than old age, or starvation through want of care, has ever attacked them. Nor do flies annoy or vex flocks as they do in the lower plains.

There are also some disadvantages attending the raising of sheep upon this mountain. The pasturage is so extensive that they often

stray off and are lost. There is also the calycanthus, that on some of the slopes grows vigorously, bearing seed readily eaten by sheep in winter, and which is a deadly poison. To guard against this, sheep should be driven up and fed before the rigor of winter and the scarcity of grass compel them to devour such fatal food. Another drawback will be found in the distance from market. While the wool may be easily conveyed to shipping points at a small cost, mutton sheep would suffer much in flesh by being driven long distances. Of all this region, embracing more than 3,000,000 acres, less than 500,000 acres are within easy reach of railroads or navigable streams.

My own impression is that the merino sheep, if properly cared for, would prove a profitable investment on these mountain lands. One precaution would be necessary; and that is to keep the bucks from the ewes until about the middle of November, so that the lambs would come after the rigorous winter weather is over.

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